CATALOGUE

OF THE

VICTORIAN EXHIBITION,

1861:

With Prefatory Essays,

INDICATING

THE PROGRESS, RESOURCES, AND PHYSICAL CHARACTERISTICS OF THE COLONY.

BY

W. H. ARCHER, Esq., Registrar-General of Victoria.

FERD. MUELLER, Esq., M.D., Ph.D., F.R.S.

R. BROUGH SMYTH, Esq., F.G.S., London; Honorary Corresponding Member of the Society of Arts and Sciences, Utrecht; Secretary of Mines of the Colony of Victoria.

PROFESSOR NEUMAYER.

FRED. McCOY, Esq., Professor of Natural History in the University of Melbourne, and Director of the National Museum of Victoria.

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WM. BIRKMYRE, Esq.

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PREFACE.

The present Exhibition will be found to differ essentially from that which preceded it; for, whereas the former was composed almost exclusively of the industrial products of other countries, it will be found that such commodities are scarcely represented on the present occasion. In the interval which has elapsed between the two events, the Colony has attained such a stage of development as could hardly have been anticipated by those who witnessed the disorganization of society, and the paralysis of the ordinary avocations of industry, which followed the gold discoveries. Mining having subsided into a settled pursuit, and the energy and enterprise of our population flowing once more into their accustomed channels, manufactures have been established, mechanical skill finds abundant opportunities for its exercise, the intelligence, the invention, and the artistic faculties of our people obtain free scope, and the gratifying results are manifested in the Exhibition now opened. Hitherto, little has been known, even to ardent enquirers, as to the actual progress which this Colony was making in Manufactures and Arts. Now and then a casual paragraph in a newspaper mentioned the establishment of a mill or factory; the discovery of a new mineral or vegetable product, possessing a commercial value and applicable to useful purposes; or the local fabrication of a commodity previously imported from abroad, but the aggregate results of all these separate operations, escaped attention or evaded calculation. They are now presented in a collective form; and when it is remembered that we are but a

handful of people, occupying a country which has been colonized for less than a quarter of a century; that we inherited nothing of that which we possess; that we have had an immense amount of rough work to perform, in order to render the country habitable, passable, and capable of affording us sustenance; and that we are severed by the circumference of half the globe from the appliances and the civilization of the old world, it must be admitted that our time has not been mis-spent, and that the skill, the industry, and the inventive genius of our population in no wise fall below those of their European and American compeers.

A special value has been conferred upon this Catalogue by the prefatory Essays contributed by the gentlemen whose names are attached. Probably, so much information with respect to the position, prospects, and physical characteristics of the Colony was never before presented in so compendious a form. Thus augmented, the Catalogue may be said, indeed, to comprise a history of the past, a record of the present, and a prophecy of the future. The past progress of Victoria is clearly mapped out, the point of development now attained distinctly defined, and its ultimate advancement and prosperity unerringly indicated by the magnitude and variety of the resources herein enumerated. It is scarcely possible to speak of either subject, without a feeling of gratulation; for meagre as this Exhibition may appear, in comparison with those which are periodically held in European capitals, it nevertheless assumes an important character when estimated with regard to the number and the scattered distribution of our population.

INTERNATIONAL EXHIBITION OF 1862.

COMMISSION.

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith:

To our trusty and well-beloved SIR REDMOND BARRY, Knight, one of the Judges of our Supreme Court of our Colony of Victoria; the Honorable SIR FRANCIS MURPHY, Knight, Speaker of the Legislative Assembly of our said colony; the Honorable JOHN HENRY BROOKE, President of the Board of Land and Works of our said colony; the Honorable Sir JAMES FREDERICK PALMER, Knight, President of the Legislative Council of our said colony; the Honorable RICHARD HEALES, Chief Secretary of our said colony; the Honorable WILLIAM CLARK HAINES, the Honorable JOHN O'SHANASSY, the Honorable CHARLES HOTSON EBDEN, the Honorable CHARLES GAVAN DUFFY, the Honorable JOHN BASSON HUMFFRAY, Commissioner of Mines of our said colony; JOHN MACADAM, Esquire, Medicinæ Doctor, Government Analytical Chemist in our said colony, Members of the Legislative Assembly of our said colony; FREDERICK MCCOY, Esquire, F.G.S.L., Professor of Natural Science in the University of Melbourne, in our said colony; ALFRED RICHARD CECIL SELWYN, Esquire, Government Geologist in our said colony; FERDINAND MUELLER, Esquire, Medicinæ Doctor, Government Botanist in our said

colony; RICHARD EADES, Esquire, Medicinæ Baccalaureus; CHARLES EDWARD BRIGHT, Esquire, and ROBERT McDOUGALL, Esquire, of our said colony of Victoria.

GREETING:

WHEREAS it has been publicly notified that an International Exhibition of Agricultural and Industrial products will be held at London, in the year One thousand eight hundred and sixty-two: And whereas it has been proposed that a Commission should be appointed for the purpose of receiving articles the produce or manufacture of our colony of Victoria, and of exhibiting the said articles in the said colony, and of selecting from and transmitting to London such articles as may be thought worthy of exposition in the said International Exhibition: Now know you, that We, reposing special trust and confidence in your knowledge and ability, have thought fit to constitute and appoint and by these presents do constitute and appoint you, Sir Redmond Barry, President of the said Commission, Sir Francis Murphy and John Henry Brooke, Vice-Presidents of the said Commission, and Sir James Frederick Palmer, Richard Heales, William Clark Haines, John O'Shanassy, Charles Hotson Ebden, Charles Gavan Duffy, John Basson Humffray, John Macadam, Frederick McCoy, Alfred Richard Cecil Selwyn, Ferdinand Mueller, Richard Eades, Charles Edward Bright, and Robert McDougall, to be our Commissioners to devise and carry out the details necessary to facilitate the exhibition in our colony of Victoria of articles the produce or manufacture of our said colony, and the transmission to London of such said articles as may be selected for exposition at the International Exhibition to be held at London in the year One thousand eight hundred and sixty-two: And for the purpose of aiding you in the execution of the premises, We hereby appoint our trusty and well-beloved John Macadam, aforesaid, to be Honorary Secretary to this our Commission: And we do by these presents give and grant to you, or any three or more of you, full power and authority

to carry into effect the purposes of this our Commission by all lawful ways and means whatsoever: And we do further will and direct that you do report in writing your proceedings from time to time to His Excellency our Governor of our said colony, and do submit all measures which you may deem requisite for his approval or disallowance previously to carrying the same into execution: And lastly, we do by these presents ordain that this our Commission shall continue in full force and virtue, and that you our said Commissioners, or any three or more of you, shall and may from time to time, and at any place or places, proceed in the execution thereof and of every matter and thing therein contained, although the same be not continued from time to time by adjournment.

Witness our trusty and well-beloved Sir Henry Barkly, Knight Commander of the Most Honorable Order of the Bath, Captain-General and Governor-in-Chief of our colony of Victoria, and Vice-Admiral of the same, at Melbourne, in our said colony, this eighth day of January, in the year of our Lord One thousand eight hundred and sixty-one, and in the twenty-fourth year of our reign.

(L.S.) HENRY BARKLY.

By His Excellency's Command,
R. HEALES.

VICTORIAN EXHIBITION, 1861,

PRELIMINARY TO THE INTERNATIONAL EXHIBITION IN LONDON, 1862.

SHORTLY after they were appointed the Commissioners issued the following Address to the Public:—

VICTORIAN EXHIBITION, 1861.

LONDON INTERNATIONAL EXHIBITION, 1862.

HER MAJESTY THE QUEEN having been graciously pleased to command that an International Exhibition of Agricultural and Industrial Products be held in London in the year 1862, His Excellency SIR HENRY BARKLY has thought it proper to issue a commission, under the Great Seal of the Colony, to the persons therein named, directing and empowering them to devise and carry out the details necessary to facilitate the exhibition, in this country, of articles the produce or manufacture of the colony, and the transmission to London of such of those articles as may be selected for exposition at the Exhibition in London.

In order that this undertaking may be attended with the fullest measure of success, and that the numerous, varied, ample, and important resources of this fertile territory may be adequately represented at the approaching competition of nations, the Commissioners call upon the people of Victoria in general to give them a ready and willing assistance. To those engaged in the different branches of industry they more particularly appeal, and earnestly request that they will exert themselves so that a collection of objects worthy of the country and of the great occasion may be supplied.

Preliminary to the Exhibition in London, an Exhibition will be held in Melbourne in or about the month of October next. No objects not presented at the latter will be transmitted to London, unless exceptional circumstances, such as recent discovery, capture,

production or completion, intervene to prevent their being so presented. On these circumstances the Commissioners will decide.

The Commissioners do not pledge themselves to transmit to London any article which, in the estimation of the judges, does not reach the standard of excellence fixed by them. It is therefore of imperative necessity that those who intend to compete should make their exertions conformable to the regulations, which will be published, and also that they should be made aware of the principles by which the judges will be governed in deciding in favor of the different descriptions of objects presented.

With respect to raw materials, the leading elements of merit will be utility, beauty, perfection, facility of attainment or production, cheapness, an universal adaptation to all markets, or a special fitness to meet a particular want of a more limited character.

With regard to manufactured articles—excellence of quality of materials, strength and neatness of workmanship, durability, cheapness, and economic value as a commodity for exportation or domestic consumption or use.

With reference to those which claim attention as the result of inventive or mechanical ingenuity—original contrivance, or commendable novelty in the application, combination, or economy of power, or of manufacturing process, adaptation of material, usefulness, convenience, strength, finish, and suitableness for accomplishment of the intended purpose.

While in determining on the superiority of productions of the fine arts, a judgment will be formed upon the acknowledged rules of discrimination and taste.

For the information and guidance of intending exhibitors, the objects to be exhibited in Melbourne have been ranged under seven leading classes. These include all the chief products of this country, and admit of easy expansion or re-arrangement to meet the classification required in London. They have been distributed into sections, which are subdivided into minor groups, to be themselves again separated into more particular enumeration of articles.

Each class will be under the direction and management of a responsible committee, formed for the purpose of communicating with the public in a more specific manner than can be done by a general advertisement such as the present.

These committees are prepared to enter into correspondence with municipal and other local bodies and societies, and with individuals,

and by means of the aid thus afforded, and the useful agency of the Press, will cause intelligence of the general movements relating to the Exhibition to be circulated from time to time.

Thus any person resident in any part of the country can at once refer for instruction or advice to the representatives of the class under which the object he proposes to exhibit is found.

The Commissioners have entered on the duties entrusted to them with a strong sense of the responsibility they have undertaken—a responsibility now shared with them by the public. They know that much is expected; they know that the expectations respecting the forthcoming display are in proportion to the wealth and to the opportunities of cultivating in security the arts of peace enjoyed by those who inhabit this favored country; they know, moreover, that much can be done.

It is due, then, to the intelligence, activity, and the honorable spirit of emulation of its people, that these expectations may not be disappointed.

REDMOND BARRY,
President of the Commission.

In inviting contributions to this Exhibition, the Commissioners decided upon dividing the exhibits into seven classes, and to restrict, wherever practicable, the quantity of each article. The classification adopted and the restrictions imposed will be found detailed hereunder:—

CLASS I.

AGRICULTURAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

Section I.—Vegetable Kingdom.

A. Cereals commonly cultivated in Europe ...	... 2 sacks.
B. Cereals cultivated elsewhere	... 2 „
C. Millet and other small grains used as food	... 2 half-cwt. parcels.
D. Pulse and cattle food	... 2 „

E. Grasses (artificial), fodder plants, and agricultural roots	2 one-cwt. parcels.
F. Flours or preparations of the above classes ...	2 barrels.
G. Starches of all kinds made from wheat, maize, potatoes, &c.	2 half-cwt. parcels.
H. Oils, seeds, and their cakes	2 "
I. Hops, and other aromatic plants used for like purposes	2 one-cwt. parcels.
K. Malt and other vegetable substances used in brewing	2 "
L. Ale, beer of any description	2 barrels.
M. Miscellaneous.	

Section II.—Animal Kingdom.—Animal Food and preparations of Food.

A. Meat, salted, smoked, or dried	2 one-cwt. parcels.
B. Meat (preserved), jelly, gelatine, albumen, and portable soup	2 tins each.
Milk, consolidated or preserved	2 "
Butter (salted or preserved)	2 kegs each.
Cheese	1 of each kind.
C. Honey, and its preparations	2 jars each.
D. Blood, and its preparations.	
E. Industrial products, as glue, &c.	
F. Hides, raw, salted, dried	2 hides or skins of each.
G. Miscellaneous.	

CLASS II.

HORTICULTURAL PRODUCTS, AND THE MANUFACTURE AND PROCESS CONNECTED THEREWITH.

A. Wine	2 dozen bottles.
Perry	" "
Cider	" "
Spirits	1 dozen "
Liqueurs	" "
B. Fruits, dried	2 packages.
Fruits (preserved), or Jams	¼ to ½ doz. bottles.
Pickles	" "
Sauces	" "
C. Seeds	2 pkges. each kind.

D. Olive Oil ... ... 2 bottles.
Castor Oil ... ... "
Other pressed Oils ... ... "
Essential Oil of Peppermint ... ... 1 to 2 oz.
E. Dyes ... ... 2 pkges. each kind.
F. Sugar of Sorghum ... ... 5 lbs.
" Beet ... ... "
G. New Zealand Flax, and other fibrous plants ... 2 to 5 lbs. each.
H. Paper material ... ... 2 samples each.
I. Models of Fruit and Vegetables ... ... 1 to 2 of each.
K. Miscellaneous.
Silks ... ... ⅛ to ¼ lb.
Medicinal herbs and roots ... ... 2 packages.

CLASS III.

INDIGENOUS VEGETABLE PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

A. Timber of trees of large dimensions, transverse sections 2 feet long, with the bark adhering ; planks 8 feet long, 4 inches thick.
Timber trees of smaller dimensions, transverse sections and planks as large as obtainable.
B. Resin of various eucalypti ... ... 2 lbs. of each.
Varnish prepared of indigenous resins ... ... ½ to 1 lb.
C. Gum of various acaciæ, or other trees ... ... 2 lbs.
D. Bark of wattle ... ... ½ cwt.
Sassafras, or other medicinal barks ... ... 5 lbs. each.
Galls ... ... 5 lbs.
Dyes, sufficient quantity for experiment.
E. Fibres, raw and prepared, enough for exhibition and examination.
F. Paper material ... ... 2 samples of each.
G. Manna and other saccharine secretions ... ... 1 lb.
H. Fruits, dried or preserved ... ... 2 packages.
I. Essential oils of eucalyptus, melaleuca, acacia, flowers, &c. ... ... ½ to 2 oz.
K. Soda ... ... ¼ cwt.
L. Potash ... ... 2 to 5 lbs.
M. Grasses and other fodder plants or seeds ... 2 packages each.
N. Alkaloids ... ... ¼ oz.
O. Medicinal herbs, roots, &c. ... ... 2 packages.
P. Articles manufactured from vegetable substances by the Aborigines.
Q. Seaweeds.
R. Miscellaneous.
Vegetable productions used as human food, enough for exhibition and examination.

CLASS IV.

MINERAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

A. Mining and quarrying operations.

B. Ores and metallurgical operations.

C. Non-metallic mineral products, including geological specimens, building materials, and lime, &c.

D. Geological maps, plans, and sections.

E. Geological, mineral, and mining models of strata and machinery.

F. Miscellaneous.

Examples of the metallic ores, with the matrices with which they are embedded, in samples not exceeding 1 cwt., accompanied if possible by a statement of the size of the vein or deposit, exact locality, depth from the surface, cost of extraction (when known), chemical constituents, market value, and any other information.

Building stones should be in blocks capable of affording a dressed cube of 6 inches, with information relative to locality and cost of production.

Sands, lime, gypsnm, or plaster of Paris, cements, &c., not exceeding half cwt.

Slates and flags, in sample sizes, commonly used for flooring, roofing, or other pnrposes, with prices, exact locality, and any other information relating thereto.

Clays of all kinds, in quantities not exceeding half-cwt., with specimens of bricks, tiles, and pottery manufactured therefrom, with exact locality, and information relative to cost of production, &c.

Coals and lignites, in bags or blocks not exceeding one cwt., with statement of the depth and thickness of seam or deposit, exact locality, and any information relative to cost of extraction and probable market value, together with chemical constitntion (when known).

No geological specimens, nnless possessing especial interest, or economic value, to exceed 5 lbs. weight.

Any models forwarded must be exactly proportioned to a scale fixed on them.

Maps, plans, and sections illustrating mining and other field engineering operations connected with the gold fields will be gladly received.

CLASS V.

MACHINERY, INSTRUMENTS, TOOLS, AND IMPLEMENTS.

A. Machines for direct nse, inclnding carriages, railway and marine mechanism, and motive engines of all kinds.

B. Mining, metallurgical, and chemical machinery, tools, implements, and apparatus.

C. Agricultural and horticultural machines and implements.
D. Philosophical, including optical and pneumatic, musical, horological, and surgical instruments.
E. Civil engineering, architecture and building contrivances, naval architecture, military engineering, guns, weapons, &c.
F. Miscellaneous.

All machines, illustrated wholly or in part by models, to have the scale of such model attached; also a statement of the cost of the working machine.

CLASS VI.

ANIMAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

SECTION I.

A. Wool—fleece and scoured...	25 lbs. each.
B. Hair, bristles, dressed feathers, down, furs, skins, calf-skins, kangaroo skins	2 skins each.
C. Leather and Tanned Hides—Crop hides, butts, harness hides, shoe hides, kip hides, calf-skins, kangaroo skins	2 each.
Curried Leather—Black harness, brown harness, rein hides, black and brown, bridle butts, stirrup butts, skirt hides, bag hides, shoe hides, kip hides, calf-skins, kangaroo skins, basils, hog-skins	2 each.
Horns	20
Hoofs	40
Bones	½ cwt.
Blood, charcoal, ammonia, and other preparations from such animal substances.	
D. Fat.	
Tallow	usual packages.
Stearine	„
Oils—trotter and neats' oil	2 quarts.
Glycerine and other preparations from such animal substances	usual packages.
E. Guano—Anglo-Australian Company, Percy Island Guano, Flat Island Guano	½ cwt.
Bone dust	„
F. Fish, dried	6 each.
Oils	2 quarts.
Bone, skin, and mutton-bird oil.	

CLASS VII.

MISCELLANEOUS.

SECTION I.—ARTISTIC AND ORNAMENTAL PRODUCTS.

A. Sculpture in metallic, mineral, vegetable, or animal substances—simple, compound, or elaborate.
B. Painting, &c.
C. Engravings, woodcuts, lithographs, photographs, photo-lithography, electrotyping, in gold, silver, or other metals.
D. Casts, models, works in die-sinking, engraving on any material.
E. Miscellaneous.

SECTION II.—INDUSTRIAL PRODUCTS.

A. Printing, bookbinding, and stationery.
B. Lace, embroidery, and fancy goods.
C. Textile fabrics in silk, wool, cotton, hemp, or other material.
D. Articles of clothing.
E. Furniture, carving and working in metals, bone, ivory, papier maché, wood, including cooperage.
F. Saddlery and harness.
G. Wicker work and articles manufactured from grass, straw, bark, wire, or other material.
H. Plate and jewellery.
I. Cutlery and general hardware.
K. Miscellaneous, including perfumery, confectionery, soap, hose, candles, piping, &c.

SECTION III.

A. Specimens of natural history and curiosities.
B. Miscellaneous.

REGULATIONS.

The following are the Regulations prescribed by the Commissioners for the Regulation of Exhibitors in Melbourne and in London:—

Conditions, or Points Relating to the Exhibition.

The Commissioners have fixed upon Tuesday, the 1st day of October, for opening the Exhibition, in the Melbourne Exhibition Building.

The Commissioners will be prepared to receive all articles which may be sent to them on and after Monday, the 2nd day of September, and will continue to receive goods until Saturday, the 21st day of September, inclusive.

Intending Exhibitors are requested to apply without delay for a form of application for space, which can be obtained of the Hon. the Secretary, at the Offices of the Commissioners, Melbourne, or at any of the various Post Offices, Police Courts, and Municipal Councils throughout the Colony, and such applications (properly filled up) must be sent in without delay, and not later than Saturday, the 17th day of August.

Exhibitors who desire that their goods should be forwarded to London for exhibition, are invited to state in the application the name and address of an agent in London who will receive such goods at the close of the Exhibition there, and all such goods will be forwarded to London, at the expense of the Commissioners, if approved of by them, and subject to the conditions of Her Majesty's Commissioners in London. If no agent be appointed, and the goods not removed from the London Exhibition within the prescribed time, or one month after the closing, the articles will be sold for and on account of the Commissioners.

Subject to the necessary limitation of space, all persons, whether

designers, inventors, manufacturers, or producers of articles, will be allowed to exhibit, but they must state the character in which they do so.

No rent will be charged to exhibitors.

Prizes, or rewards for merit, in the form of medals or certificate of merit, will be given in the Industrial part of the Exhibition.

Prices may be affixed to the articles exhibited.

The Commissioners reserve to themselves the right to exclude any articles of an inflammatory or dangerous nature, or otherwise.

Articles of great size or weight, the placing of which will require considerable labor, must be sent before Monday, the 16th day of September, and manufacturers wishing to exhibit machinery or other objects that will require foundations or special constructions, must make a declaration to that effect in their demands for space.

Any exhibitor whose goods can be properly placed together, will be at liberty to arrange such goods in his own way, provided his arrangement is compatible with the general scheme of the Exhibition and the convenience of other exhibitors.

Where it is desired to exhibit processes of manufacture, a sufficient number of articles, however dissimilar, will be admitted for the purpose of illustrating the process, but they must not exceed the number actually required.

Exhibitors will be required to deliver their goods at the Building, and to unpack and arrange them at their own charge and risk; and all articles must be delivered with the freight, carriage, porterage, and all charges and dues upon them paid.

Packing cases must be removed at the cost of the exhibitor or his agent, as soon as the goods are examined and deposited in charge of the Commissioners.

Exhibitors will receive timely notice of the date of closing of the Melbourne Exhibition, and under what arrangement the packing and removal of the articles is to be effected.

Exhibitors will be permitted, subject only to the necessary general regulations, to erect according to their own taste, all the counters, stands, glass frames, brackets, awnings, hangings, or similar contrivances, which they consider best calculated for the display of their goods.

Exhibitors must be at the charge of insuring their own goods, should they desire this security. Every precaution will be taken to prevent fire, theft, or other losses, and the Commissioners will

give all the aid in their power for the legal prosecution of any persons guilty of robbery or wilful injury in the Exhibition, but they will not be responsible for losses or damage of any kind which may be occasioned by fire or theft, or in any other manner.

Exhibitors may employ assistants to keep in order the articles they exhibit, or to explain them to visitors, after obtaining written permission from the Commissioners; but such assistants will be forbidden to invite visitors to purchase the goods of their employers.

The Commissioners will provide the main shafting and water at high pressure for machines in motion.

The Commissioners call attention to the "Decisions" of Her Majesty's Commissioners in London, wherein they state, "That communications with Foreign and Colonial Exhibitors will be made only through the Commission which the Government of each Foreign Country or Colony may appoint for that purpose; and no article will be admitted from any Foreign Country or Colony without the sanction of such Commission."

OPENING OF THE EXHIBITION.

THE VICTORIAN EXHIBITION was formally opened by His Excellency SIR HENRY BARKLY, K.C.B., on the 1st of October, 1861; and the ceremony was witnessed by a large assemblage of spectators.

His Excellency was received by Sir Redmond Barry, President of the Exhibition Commission, and by him Sir Henry and Lady Barkly were conducted to seats beneath the canopy of crimson velvet, which had been erected at the end of the nave. Major-General Sir T. S. and Lady Pratt arrived in about a quarter of an hour. The Commissioners present, besides Sir Redmond Barry, were Sir Francis Murphy, Mr. J. H. Brooke, Mr. John O'Shanassy, Mr. J. B. Humffray, Dr. Macadam, Professor McCoy, Mr. A. R. C. Selwyn, Dr. Mueller, and Mr. C. E. Bright.

As soon as His Excellency arrived at the daïs, the members of the Philharmonic Society, stationed in the organ gallery, sang "God Save the Queen."

His Excellency and Lady Barkly then made a tour of the building, and carefully inspected the leading objects in the Exhibition. On returning to their seats,

The PRESIDENT read the following address:—

"To His Excellency SIR HENRY BARKLY, Governor of the Colony of Victoria.

"Sir,—The Commissioners appointed by your Excellency, to prepare for the International Exhibition, to be held in London, in the year 1862, have the honor to invite you to declare the present Exhibition open for the admission of the public.

"You have been informed, Sir, from time to time, by the reports which we were directed to make, of the steps taken in order to carry out the duties entrusted to us.

"It is unnecessary, therefore, to delay you by a detailed account of our proceedings.

"As you are aware, Sir, the building in which we are assembled was erected to receive the contributions to the Exhibition held in Paris, in 1855.

"It contains an available area of 15,000 superficial feet. However, the applications from intending exhibitors have multiplied to such an extent, that the Commissioners found that they would be compelled either to enlarge its dimensions, or to exclude many objects, and thereby damp the enterprise of those desirous to compete.

"Experience has proved that the daring experiment indulged in by the Commissioners in 1854, has well repaid the outlay then incurred by them, inasmuch as the public convenience has been provided for during several years, and our citizens have been able to meet here on many occasions of general amusement or instruction, in numbers for which no other chamber in Melbourne could afford accommodation.

"Influenced by these considerations, your Commissioners resolved to adopt the former alternative. An addition has been made, which gives an apartment eighty feet by forty feet, calculated to form a useful adjunct to the now generally-considered indispensable Exhibition Building.

"Under the energetic superintendence of Mr. Knight, agent of the Commission, this, with several alterations to improve the internal arrangement of the original structure, has been completed in nine working days—a proof that, in case of emergency, reliance may be placed now, as heretofore, on the skill and activity of our artificers.

"Water has been conducted into the building from the Yan Yean water supply—a great national undertaking, executed since the former Exhibition took place here, at an outlay but little short of a million sterling.

"Motive power for machinery is thus furnished. Moreover, security is given in case of fire, which may quiet the apprehensions of the owners of the valuable property committed to the Commissioners' charge.

"The Commissioners may be allowed to express a hope that, moved by the enumeration of these improvements, Her Majesty's Government will see the propriety of bestowing, in future, some-

what more care upon the preservation of this graceful as well as useful structure, with which so many agreeable associations are connected.

"Your attention is first directed, Sir, to the collection of indigenous timber, made under the supervision of the committee of Class III.

"Upwards of eighty varieties have been procured from different localities, which, by reason of difference of soil and climate, of latitude, and altitude above the level of the sea, assume the characteristics of distinctive vegetation.

"These illustrate, to a considerable extent, the resources which we possess in the forests of the interior, as well as in those which clothe the seaboard, ready to become available for domestic use and for export when rendered easy of access by improved means of communication.

"By the unwearied perseverance of our accomplished botanist, Dr. Mueller, they are presented under conditions which convey the best possible idea of their texture, density, and fineness of grain, of their aptitude for constructive or ornamental purposes, and allow of their being submitted to the usual tests to ascertain their strength, elasticity, durability, and other properties.

"A scientific nomenclature accompanies the collection, which must prove important to the learned observer, and, in many instances, form an especially interesting supplement to the history of the hitherto but partially explored flora of the continent.

"The committee of Class II. presents a set of models of the principal autumnal fruits and vegetables grown here. The faithful representation of size and color will enable you to judge of the development and symmetry of the produce of our gardens and orchards, and sanction the belief that in quality the originals will bear not unfavorable comparison with the horticultural products of most countries.

"A further supply of models of the spring and summer growth will be prepared, as none of the objects themselves could be safely conveyed to London.

"These models are made with gypsum, coated, in some instances, with wax, or gum tracacanth, in others, saturated with oil, so that the natural hue or bloom of the fruit may be accurately depicted.

"The pains taken in the preparation will, it is confidently

expected, enable them to resist effectually the changes of temperature on the homeward voyage.

"A cabinet of essential oils, distilled from the leaves of indigenous trees and shrubs, also deserves your attention.

"From what has been achieved by the labors of the gentlemen who have contributed these, it is obvious that pharmacy and the useful arts may be extensively benefited if researches were further prosecuted in this direction.

"Here also is found WINE—a comparatively new product, one which will, therefore, excite much interest. That interest must, however, for the present moment be speculative, as we shall have to abide the decision of experts to ascertain in what degrees of excellence they will be respectively placed. The number of kinds brought in is considerable, but we are informed that many more descriptions not to be shown here will be sent to England through the Commissioners, the causes of retention by the proprietors of vineyards are the newness or the age or the delicacy of the vintages, together with a desire to avoid the disturbance consequent on frequent removals.

"The subjects of vine-growing and wine-making have engaged the attention of so many enterprising yet cautious cultivators, and have been treated of by so many well instructed pens, that the prospects of those engaged upon these branches of profitable employment may be considered encouraging.

"OIL, from the olive, with the fruit itself—the appropriate accessory of the rich and fruity juice of the grape—are seen for the first time grown and made almost within the precincts of the town.

"You remark, Sir, doubtless, the absence of the representatives of two of the staples of our wealth—WOOL AND CORN. As the operations of shearing and harvest have not yet begun, only a few samples of either have been procured. Nevertheless, it is gratifying to be able to state that we have received assurances on which we may rely, that each will be fully represented in London.

"Hitherto, as far as an opinion may be hazarded, the season promises auspiciously for abundant crops of cereals and other productions of the farm.

"The general and local Agricultural Societies have been enlisted to aid the Commissioners in obtaining, at the proper time, the best samples for transmission to England.

"Portions of selected fleeces of the finest quality will be wrought by the looms of Europe, into fabrics of the most delicate textures, with appropriate patterns, suggested by flowers of native growth.

"Displayed, as these will be, together with the wool in the progressive stages of preparation through which it will have to pass, a true estimate may be formed of the value of this important object—the earliest, and despite the discouragements and disturbing influences which have more or less affected its cultivation—the most steadily increasing of our articles of export.

"Of GOLD, abundance will be exhibited, and under circumstances favorable, in many respects, financially and scientifically.

"Some of the banks in Melbourne have, with most commendable liberality, consented to allow the Commissioners to select from their crude gold, specimens of extraordinary size, or of peculiar structure, or possessing unusual combinations of rock, ore, or mineral. These they permit the Commissioners to exhibit here and also in London without charge, the Commissioners defraying the cost of insurance and freight, Her Majesty's Government undertaking to guarantee against all risks not covered by the ordinary policy of insurance.

"This arrangement has saved the country the loss of interest upon the capital which would otherwise have been necessarily employed in the purchase of a sufficient quantity, and has liberated funds in the hands of the Commissioners which may be advantageously used for other purposes.

"Knowing how much the scientific visitors to the Exhibition in London will be interested in the process in use here for separating gold from quartz, the Commissioners have resolved to send there a crushing machine, with washing and amalgamating apparatus. It will be exhibited in action, and quartz taken from different gold fields, at various depths from the surface, will be crushed and washed on stated days.

"A particular enumeration of even a few of the objects worthy of special commendation would trespass on you, Sir, unduly; and as the juries of the different classes will have to pronounce upon the claims of the exhibitors, it is prudent to abstain from a premature expression of opinion respecting them.

"The CATALOGUE contains a goodly array of names.

"This, which deserves the name of an important volume, has

(by reason of the delay in sending in applications for space) been printed under extremely unfavorable circumstances; in fact, the last sheets ready have within the last few minutes been thrown off from the press.

"The present appeared to the Commissioners a suitable occasion to collect, in authentic and simple form, the best materials with which to set the people of Europe right upon many points relative to this country, respecting which ignorance and confusion prevail.

"They therefore requested several gentlemen presiding over public departments, having within their reach copious information of authority, to compile a preface for the Catalogue.

"With this request they have kindly complied, and a preface is presented for the benefit of the public.

"The first chapter, written by Mr. Archer, the Registrar-General, gives an able statistical sketch of the country, with an array of tables, the preparation of which involved great labor, enthusiastically devoted.

"The second is by Dr. Mueller, the Government Botanist.

"The third, by Mr. Brough Smyth, of the Mining Department, under whose supervision a large collection, illustrative of mining and surveying, together with various ores, &c., has been made.

"The fourth, on Meteorology, an elaborate paper, by Professor Neumayer.

"The fifth, on Zoology, ancient and recent, by Professor McCoy, Professor of Natural Science in the University of Melbourne, who also presents some numbers of his projected work on that subject, with drawings on stone, in several different colors, of exqusite delicacy.

"The sixth, by Mr. Selwyn, on Geology, who also exhibits a suite of maps, geological specimens, and admirable photographic representations of fossils.

"The seventh, on Gold and its history in Victoria and elsewhere, by Mr. Birkmyre.

"It is resolved to cause this preface to be reprinted, translated into two or more European languages, and distributed in London at the Exhibition there.

"Another work, THE SEASON TICKET, produced at the Department of Lands and Survey, may be mentioned. The clear letterpress of this minute publication, smaller than that of any movable type, is printed by photo-lithography, a process for the invention of

which Mr. Osborne is entitled to well-earned praise. It is usually applied here to the rapid and economical transfer of maps and plans.

"Simultaneous but independent efforts were directed to this discovery in England, in America, and in this country. That in use with us anticipated the others by several months, and it is conceded that this process, patented by Mr. Osborne, has not only gained a priority of invention, but attained a degree of perfection admitted by the generosity of his competitors.

"STEREOTYPED PRINTING, on a new principle, recently invented in England, by a process much improved by Mr. Ferres, the Government Printer, also claims your attention. This gentleman has happily suited the subject of his exhibit to the occasion, and submits a copy of the Act of Parliament passed for the protection of the rights of inventors during this Exhibition, stereotyped and printed in gold, which awaits your signature.

"Amongst the manifold lofty designs within the prescience of the illustrious founder of the decennial Exhibitions in London, is one, Sir, of infinite consequence, namely, that by such means periodical opportunities would be afforded for holding up a vivid picture of the actual position of the British Empire and its dependencies, at different epochs, and for showing the intermediate progress made in those matters which chiefly concern the material prosperity of mankind.

"In these respects, probably, Victoria will appear to advantage, and the progress made by her during the last decade may rival that of any of the numerous possessions of Her Majesty.

"With your permission, Sir, some of the most salient of the statistics may be extracted from the first chapter of the Catalogue. These will fortify the opinion which the Commissioners venture to express.

"In the year 1851, when the first great Exhibition was inaugurated in London, the POPULATION of Port Phillip was 77,345. Since that period the district, then an outlying dependency of the colony of New South Wales, has been erected into an independent colony, under the name of our gracious Sovereign, and now contains a population of 540,671 souls.

"The Export of GOLD through the Customs in that year, the first of its discovery, was in 1851, 145,146 oz., of the value of £580,587; in 1860, 2,156,660 oz., of the value of £8,626,642. The aggregate in ten years was 23,917,980 oz., of the value of

£95,671,918; to which must be added a moderate proximate estimate of the quantity exported through other channels,—2,067,064 oz., of the value of £8,269,258,—giving a grand total of 25,985,044 oz., of the value of £103,941,976.

"Of WOOL, the quantity and value exported are equally remarkable. In 1851, it was 16,345,464 lb., of the value of £734,618; in 1860, it was 24,273,210 lb., of the value of £2,025,066; making, in ten years, a total of 227,505,610 lb., of the value of £15,821,710.

"The LANDS sold have increased from—in 1851, 334,308 acres, to, in 1860, 3,994,433 acres, for which £9,213,812 have been paid into the Treasury. Of these under cultivation, from—in 1851, 52,176 acres, to, in 1861, 419,252 acres. And while, during the whole period, the quantity of agricultural products of all kinds fell far short of the requirements of the people, and large sums have been annually paid for these necessary articles of consumption brought from abroad, there is now a reasonable prospect that at no very distant day the balance of trade, already sensibly affected, may be turned in our favor, and that we may have to seek foreign markets for the disposal of a surplus.

"But it is not in these particulars only that Victoria may point to the advance she has made.

"In the acquisition of POLITICAL PRIVILEGES she has proceeded from a condition emerging from the severe restrictions upon British freedom under which the elder colony had been so long governed, to one in which her people enjoy the invaluable privileges of a perfect liberty in person and conscience, and have obtained the fullest measure of representative and responsible Government. MUNICIPAL ADMINISTRATION is extended to forty-six thriving towns, the statistics of which, exhibited in illuminated penmanship, claim more than passing notice.

"Places of PUBLIC WORSHIP have increased from, in 1851, 39, to, in 1861, 874, with accommodation available for 150,000 persons, ministered to by 340 exemplary clergymen. 30 INSTITUTIONS are maintained, at an expenditure exceeding, in the past year, £140,000, for the relief of those suffering from bodily or mental attacks, for destitute youth, and indigent old age. An UNIVERSITY, with 104 students, confers degrees which, by the gracious pleasure of Her Majesty, are recognized as academic distinctions equal in rank, precedence, and consideration with

degrees conferred by the venerable seats of learning in the mother country. 880 SCHOOLS have been opened, in which 51,668 scholars receive primary instruction; together with many institutions established to promote scientific, literary, and intellectual pursuits. A PUBLIC LIBRARY has been founded, which already contains 30,000 carefully selected volumes, visited during the nine months of the present year by 117,926 readers.

"Finally, not to detain you beyond the limits of your indulgence, the ARTS, MANUFACTURES, and TRADES have so much expanded their operations that while in 1854, when this building was first opened, but 37 trades and manufactures were represented, on this occasion applications for space have been received from 236 branches of the mechanical and industrial arts, the merits of the productions in which will in a short time be decided on by competent jurors.

"£5,272,620 have been expended in the formation of ROADS and BRIDGES; and in the erection of PUBLIC BUILDINGS and other PUBLIC WORKS, £3,391,753 6s. 8d. 99¾ miles of Government RAILWAY have been opened, and 182 miles are in course of construction, involving an expenditure of £8,000,000 sterling; of Railways undertaken by private companies, 21 miles have been opened, enterprises in which capital to the amount of £1,146,212 has been embarked. At the request of the Commissioners, transit for goods intended for the Exhibition has been permitted, a boon which they gratefully acknowledge.

"1,504 miles of ELECTRIC TELEGRAPH have been established within our boundaries, at a cost of £163,000. The connection with the capitals of the adjoining Governments—Adelaide, 800 miles on the north-west; Hobart Town, 300 miles on the south (a portion submarine, unhappily interrupted at present); Sydney, 600 miles on the north-east—has been completed for some time, and that with Brisbane, the capital of Queensland, will be perfected ere long, which will give in extreme length a line for transmission by the wire of considerably above 2000 miles. It may be the good fortune of the person honored with the discharge of the duties of President at the next Exhibition to announce that we are brought into actual contact with the great metropolis of the empire. The use of this wonderful agent has been placed at the disposal of the Commissioners by Her Majesty's Government, an act which has much facilitated communication with the remote interior.

"It may incidentally be remarked, for the benefit of those whom it may concern, that the working apparatus in the north-west corner of the building, near the branch of the Post Office, is *en rapport* with the detective and chief Police Stations, and that a code of signals has been prepared, by which, if necessary, intelligence may be flashed in any direction, and to any distance.

"The Commissioners have still, Sir, to combat the extensively prevailing notions that it is too late to make an effort to produce objects worthy of a place in the International Exhibition, and that matters familiar to our eyes here are not worth sending to such a distance. These notions should be dispelled—there is ample time for the earnest and patriotic worker. In three months and a half between this and the middle of January, when the Commissioners will close their labors here, much can, much *must*, be done, if it be the will of our people that the resources of the country, the genius, the enterprise, and the industry of her inhabitants, are to be represented respectably.

"Some days must elapse before all the objects to be sent from the interior of the country can arrive. Several which have taken more time in completion than was anticipated (including the gold case) are not yet ready. When all are assembled, the Commissioners will be enabled to ascertain the instances in which deficiencies exist, when renewed and increased exertion must be put forth.

"The efficient local committees already organized, to which the Commissioners are largely indebted, will be roused by the present competition to distinguish themselves still further. Excursions may be made by our agents to districts as yet unvisited by them, so that objects (to be ranged under several subdivisions of the respective classes) not yet forthcoming, may be brought into deserved prominence.

"Probably, Sir, while you are ready to accord your meed of approbation to the numerous instances of ingenuity and skill displayed here to-day, you may be of opinion, with the Commissioners, that what is wanted for the inquiring minds and sagacious judgments of those who will congregate at the International Exhibition, is, not so much a few objects of such excellence in invention and execution as you see around you, as what may be invidiously or indiscreetly deemed by some a rude variety.

"We desire to exemplify the almost unbounded natural sources

of wealth with which we are blessed; to display the germs of robust development, the elements of a not remote perfection; to demonstrate that Victoria affords to the prudent, opportunities for the safe and remunerative investment of capital; for the exercise of scientific skill, directing and animating steady persevering labor; and to prove that she contains within the broad expanse of her fertile territory room for hundreds of thousands who may, under the guidance of Divine Providence, win for themselves an honorable independence, and emulate the refined civilization and moral greatness which so eminently distinguish the country from which we are sprung."

HIS EXCELLENCY'S REPLY.

"SIR REDMOND BARRY AND GENTLEMEN OF THE COMMISSION:

"You may well be proud of the preparations made under your auspices for illustrating the progress and the resources of this colony at the World's Industrial Congress next year.

"I rejoiced from the first at the readiness with which the Government agreed that Victoria ought to be represented on that occasion, and at the alacrity with which the Legislature granted the funds requisite for the purpose. I felt confident of a successful result when the names of those who had accepted the office of Commissioners were submitted to me, and even more so when I learned that they had engaged as their agent in making the necessary arrangements, the gentleman who had first called public attention to the expediency of preparing at the earliest possible period, for what is, in some respects, a maiden effort. I am aware, indeed, that, as you remind me, this ornamental and most useful building in which we to-day assemble, was erected to receive the collections for an Exhibition held at Paris in 1855; but Paris, though the head quarters of taste, of magnificence, of luxury, is not so appropriate a sphere for the display of the commercial enterprise, the mechanical ingenuity, and the practical industry of a community of British origin, as is London, the fitting capital of the workshop of the world, as Great Britain may be justly styled; and as this colony had no distinct existence at the time of the Great London Exhibition of 1851, that of next

year will in reality afford the first opportunity for asserting its rank and importance amongst the provinces of the British Empire.

"By displaying its great natural wealth, and the adaptability of its soil and climate for every species of production, at such a competition, we shall most effectually promote the object we have in view, of attracting the surplus capital and labor of the mother country to our shores. We can show, as you observe, the astonishing progress which this colony has made in all the arts of civilization and appliances of wealth within the past ten years—progress unsurpassed, as you truly state, by any other British possession—nay, unrivalled, I believe, by that of any other country on the face of the globe. Within this decade, as you point out, the neglected district of Port Phillip has expanded into the important colony of Victoria—the uninfluential dependency of New South Wales into a state possessed of the fullest measure of constitutional government.

"Its population has increased more than sevenfold, its cultivated land in even larger proportion, its flocks yield half as much more wool, its other products are equally augmented in value, whilst the gold, the discovery of which has stimulated, if not caused, this wondrous development, is so far from showing symptoms of exhaustion, that, though upwards of a hundred millions' worth has been extracted from the alluvial flats and intersecting quartz reefs, last week's Government escort brought down nearly 50,000 ounces—a quantity equal to the average of the entire period.

"The announcement of these simple facts, in the preface to your Catalogue—still more their corroboration by such evidence as will be submitted to ocular demonstration at home by means of this collection will do more to promote immigration and to advance the interests of Victoria than the most eloquent lectures that could be delivered or the most ponderous blue books that could be published—

> "'Segnius irritant animos demissa per aurem
> Quam quæ sunt oculis subjecta fidelibus.'

"But there is another point of view in which the scene before our eyes should strike us—an additional reason why sound policy required that this preliminary Exhibition should be held on the spot.

It cannot fail to increase our confidence in the stability of our own resonrces. It must tend to convince us of the reality of the prosperity which this colony enjoys. If disposed in the first instance to indulge in visionary expectations of wealth and happiness, the inhabitants of a new and undeveloped country are equally prone, at the slightest reverse, to undue despondency. A commercial crisis ensues from over-trading—a change in administrative policy is announced—a new and attractive field for investment presents itself elsewhere, and straightway a general cry of ruin is raised.

"The experience of the last ten years in Victoria, as here epitomized before our eyes, should surely inculcate another lesson. Merchants may fail or make fortunes; rival politicians may struggle; the hardy and adventurous digger may rashly desert for a time our proved and permanent gold fields for fancied El Dorados in other lands; but the country itself continues, notwithstanding, to make steady progress, and advances day by day towards a higher stage of material prosperity.

"Who that looks around him here, and sees what wonders have in a few short years been achieved in this country, under favor of free institutions and untrammelled industry, will venture to distrust the capacity of the British race for the exercise of the fullest powers of self-government, or doubt for one moment that a glorious destiny is, under the blessing of Divine Providence, reserved for this highly-favored country?

"I now, in accordance with your invitation, declare this Exhibition to be opened."

Sir Thomas Seymour Pratt then stepped forward and called for "Three cheers for the Queen," which call was promptly responded to.

Three cheers having been given for His Excellency, the viceregal party took their departure.

THE COLONY OF VICTORIA:

BEING

A BRIEF STATISTICAL SKETCH,

BY

WILLIAM HENRY ARCHER,

Registrar-General of Victoria, and Honorary Corresponding Member of the Statistical Society of London.

POPULATION.

Progress of Population, 1836–1861.

1. It is just a quarter of a century since the first enumeration was made of the settlers in the district now called Victoria. That enumeration took place in the year 1836; and the result arrived at was, 142 males and 35 females; or, in all, 177 souls. Twenty-five years after (7th April, 1861), the numbers had swelled to 328,651 males, and 211,671 females; or, a total of 540,322 souls.

Rate of Increase.

2. The rate of increase has naturally fluctuated very greatly at different periods. The following short table exhibits the actual gross increase from 1836 to 1861:—

Table I.—Population of Victoria, from 1836 to 1861.

No.	Date of Census.	Males.	Females.	Total.	No. of Females to every 100 Males.
1	May 25, 1836	142	35	177	24·6
2	Nov. 8, 1836	186	38	224	20·4
3	Sept. 12, 1838	3,080	431	3,511	14·0
4	March 2, 1841	8,274	3,464	11,738	41·9
5	March 2, 1846	20,184	12,695	32,879	62·9
6	March 2, 1851	46,202	31,143	77,345	67·4
7	April 26, 1854	155,876	80,900	236,776*	51·9
8	March 29, 1857	264,334	146,432	410,766	55·4
9	April 7, 1861	328,651	211,671	540,322	64·4

* 22, unspecified as to sex, omitted.

3. During the last four years (1857–1861) the population has increased very nearly one-third, or at the rate of 7·1 per cent. per annum. Should it continue to augment in the same ratio, Victoria will contain, within nine years, not less than one million of inhabitants.

Birthplaces of the People.

4. The birthplaces of the people, according to the census of 1861, have not yet been tabulated. There is no question, however, that the colonists for the most part are Europeans by birth. Up to the beginning of the present year (1861) the excess of arrivals over departures amounted to 373,877, and the addition of less than half that number, as the excess of births over deaths, would bring the number cited up to the amount of the ascertained population. In 1857 the proportions of persons of different countries to the total inhabitants were as follow:—English, 36·39 per cent.; Irish, 15·95 do.; Scotch, 13·15 do.; Chinese, 6·22 do.; Germans, 1·94 do.; Welsh, 1·12 do.; Victorian born, 16·40 do.; born in other Australian colonies, 4·13 do. The sum of these, amounts to 95·30 per cent.; the remaining 4·70 per cent. consisted of British subjects from India and other colonies, and a few foreigners other than those already mentioned. About 1,800 aborigines were counted. They are gradually dwindling away.

Immigration and Emigration.

5. From the first settlement of the country it has been the practice of the Government to stimulate the influx of certain classes of immigrants by annual pecuniary grants. In this manner during the past twenty-five years nearly 117,000 persons have been introduced. But large as this number is, it is far distanced by that of middle-class immigrants who, unaided by the State, have sought to settle among us. Their number over the same period is 543,261 souls. The total emigration in the interval amounted to 264,390 persons—of whom the most part were returning coastwise to the neighboring colonies. The number of emigrants who quitted Victoria during the year 1860 was 21,689, which, being deducted from the number of immigrants who arrived (29,037), leaves 7,348 as the net increase by immigration during

that year. The places whence the arrivals came, and whither those who left went, are given in the following table:—

TABLE II.—VICTORIA.—IMMIGRANTS AND EMIGRANTS, 1860.

Places.	Immigrants.	Emigrants.	Immigrants in excess of Emigrants.	Emigrants in excess of Immigrants.
The United Kingdom	13,470	5,727	7,743	—
New South Wales	4,719	5,909	—	1,190
South and Western Australia...	5,000	2,229	2,771	—
Tasmania	3,727	2,516	1,211	—
New Zealand and South Seas ...	507	1,438	—	931
Foreign Ports	1,614	3,870	—	2,256
Totals	29,037	21,689	7,348	—

6. It is thus plainly to be observed, that in 1860 the Immigration from the British Islands, from South and Western Australia, and from Tasmania, considerably exceeded the Emigration to those places, but that the reverse was the case as far as regards New South Wales, New Zealand and the South Sea Islands, and Foreign Ports. With reference to New South Wales, this was probably caused by the attractions which were supposed to be offered by the new colony of Queensland and by the rush of diggers to the Kiandra or Snowy River gold fields, situated on the New South Wales side of the border. The New Zealand war and the consequent removal of troops to that colony, was in all probability the reason of the departures thereto being in excess of the arrivals therefrom; and the emigration to foreign countries may reasonably be supposed to have consisted of aliens who had been attracted hither by the fame of our gold fields, but who never had any settled intention of making Victoria their home. The recent discovery of gold in New Zealand is already attracting considerable numbers of Victorian miners to that country, but whether they will be as unsuccessful as were those who joined in the disastrous Port Curtis rush in the Queensland territory, during the year 1859, remains to be proved.

DISPROPORTION OF THE SEXES.

7. From the very foundation of the colony the male inhabitants have been in excess of the females, and the assisted immigration

has been mainly directed to modify the disproportion. It will be seen by the last column of Table I, that in April, 1854, there were 51·9 females to every 100 males, and that on the 7th April, 1861, there were 64·4 females to every 100 males, so that the sexes are rapidly approaching the numerical relation they stood in to each other in March, 1851, when there were 67·4 females to every 100 males. At the rate and manner of increase experienced during the last four years however, it will take another sixteen years to balance the number of both sexes.

Area of the Colony, and Persons to a Square Mile.

8. The total area of Victoria (86,831 square miles) is nearly as large as that of England, Scotland, and Wales united (89,644 square miles), but the present colonists are for the most part congregated within a limit less than that of Scotland (31,324 square miles), and within a hundred miles of the sea coast. While, however, Scotland had (in 1851) 92 persons to a square mile, the most thickly inhabited parts of Victoria, over a similar area, have less than eighteen persons to a square mile.

Distribution of the Population.

9. Prior to the gold discoveries of 1851, sixty thousand out of eighty thousand, or three-fourths of the total population, were grouped in the seaboard counties of Bourke, Grant, Normanby, and Villiers; but in 1861, there were resident in those parts less than half, or about 250,000 persons only out of 540,000; the remaining 290,000 being settled in other parts of the colony.

Municipalities, Population of.

10. Melbourne, the capital of Victoria, and the most populous city in Australia, contains, including its immediate suburbs, about 123,000 inhabitants. The city and its environs are comprised within a radius of six miles, and are divided into fourteen municipalities. Geelong, the second town in Victoria, consists of three municipalities, containing 23,000 persons. Besides these, the three small seaport towns of Portland, Belfast, and Warrnambool have a population respectively of 2,804, 2,338, and 2,211

inhabitants. The principal inland towns have sprung up in the vicinity of the most important gold fields. The following is a list of them with their populations as ascertained at the last census (April, 1861):—

	Population.
Ballaarat, consisting of two municipalities ...	22,111
Sandhurst	12,995
Castlemaine	9,664
Maldon	3,334
Maryborough	2,477
Beechworth	2,316
Clunes	1,809
Ararat	1,455
Buninyong	1,207
Carisbrook	833

The inland towns which owe their rise principally to Agriculture, are:—

	Population.
Kyneton	2,095
Kilmore	1,675
Hamilton	1,197
Gisborne	627

11. The towns mentioned, contain in the aggregate 217,230 souls or upwards of two-fifths of the total population of the colony, and are all in possession of local self-government. The remaining municipalities are Creswick, Daylesford, Dunolly, Heathcote, and Chewton. All these are places of some importance, but their census schedules have not yet been separated.

Value of Rateable Property.

12. Excluding the last-named municipality, in which, as it has only been recently formed, no rate could be struck, the annual value of the rateable property in all the municipalities was assessed in 1860 at about £2,300,000, which at ten years' purchase would represent a total value of £23,000,000. The rates to be levied are limited by the Act (18 Victoria No. 15, Clause xxx), to a maximum of 2s. in the pound, but they range in the different municipalities from 9d. to 1s. 6d., the average being 1s. The revenue raised by rates during 1860 amounted in the aggregate to £181,668, which was supplemented by Government aid to the

extent of £143,060, making a total municipal revenue for that year of £324,728 against an expenditure of £336,629, the latter thus being slightly in excess.

District Road Boards.

13. Besides the municipal system already alluded to, another form of local self-government exists in Victoria—that of District Road Boards—which have the power to levy rates for the making and repairing of roads within their own district. These District Road Boards in 1860 numbered 42; the estimated value of rateable property within their jurisdiction was about £500,000, and its total value, at ten years' purchase, would be £5,000,000. No absolute limit is fixed as to the rates to be levied, but they must be assessed in the following proportions, viz.: "on unalienated waste lands of the Crown held on license or lease, at the rate of one farthing per acre; on pasture land alienated by the Crown, at the rate of one penny per acre; and on cultivated lands, at the rate of one shilling per acre; and the sum of one shilling in the pound on the actual annual rental or annual valued rental of messuages, tenements, or dwelling houses, and so in the like proportions at any greater or lesser rates." (17 Victoria No. 29, Clause VI.) The local revenues collected in these Road Board Districts, amounted in 1860 to about £30,000, and the Government aid to about £80,000, making in round numbers a total of £110,000. The total amount expended by these Boards during the same year was £113,000. There is no means at present for determining the precise population of the Road Board Districts, but there is little doubt that if the numbers, when ascertained, were added to the population of the municipalities, it would be found that the great majority of the people enjoy local self-government.

Density of the Population.

14. The population is necessarily very unequally distributed over the different counties and districts. For example, there are—first, those divisions possessing large towns and gold fields, and these are thickly populated; secondly, there are others occupied chiefly for pastoral purposes, containing but few inhabitants; and, thirdly, there are some immense tracts of country which are not

only almost uninhabited, but to this day have been but partially explored. Under the first head may be reckoned *Bourke*, the metropolitan county, which has 109 persons to the square mile; *Talbot*, which contains Castlemaine, the Mount Alexander, and other important gold fields, and has 55 persons to the square mile; *Grant*, in which Geelong and a section of the Ballaarat gold field are situated, having 38·5 persons to the square mile; *Grenville*, containing the principal portion of the Ballaarat and several other gold fields, having 20 5 persons to the square mile; *Dalhousie*, an extensive agricultural county, and in it the townships of Kilmore and Kyneton, having 17·2 persons to the square mile; the *Loddon District*, containing the town and gold fields of Sandhurst, having 10·6 persons to the square mile; and *Villiers*, also an agricultural county, and possessing the townships of Belfast and Warrnambool, having 8·3 persons to the square mile. Under the second head may be placed *Ripon*, which in spite of the Ararat town and gold fields, and also of the agricultural population located at its eastern extremity, has only 5·4 persons to the square mile; *Normanby* including the town of Portland, but having only 4·1 persons to the square mile; *Evelyn*, with 3·5 to the square mile; *Mornington*, with 2·4 to the square mile; the *Murray*, containing the town and gold fields of Beechworth and the Ovens, but with no more than 2·3 to the square mile; *Hampden*, with 2·2 to the square mile; *Rodney*, *Dundas*, and *Polwarth*, with less than 2 persons to the square mile; and *Anglesey*, *Heytesbury*, and *Follett*, with less than 1 person to the square mile. Of the third class the *Wimmera*, although it has large and populous gold fields at its south-eastern extremity, has only 1 person on an average to a square mile over the whole of its vast extent; and *Gipps Land*, some portions of which have never been trodden by the foot of the white man, has only ·4 of a person to the square mile.

Capability of holding increased Population with existing densities.

15. Excluding those portions of the Wimmera (about two-thirds), which are covered with thick Mallee scrub, and supposing that the rest of Victoria were as populous only as the four counties —Bourke, Grant, Grenville, and Talbot, which do not possess greater natural capabilities than other parts of the colony, and

together average 56 persons to the square mile, the population of Victoria would be distributed as follows:—

			Inhabitants.
1. The actual present population of the counties of Bourke, Grant, Grenville, and Talbot	...		327,995
2. The calculated population which the remaining twelve counties would contain if peopled to the extent only of the four counties just named	...		1,013,376
3. The calculated population, in like manner of the following districts:—			
Gipps Land	...	807,156	
The Loddon	...	340,816	
The Murray	...	751,968	
Rodney	...	100,016	
Wimmera, (one-third only)	...	506,128	
			2,506,084
Total	...		3,847,455

16. Thus it is seen that, without increasing the density of the population as it exists in four of the most populous counties, Victoria would admit of an addition of upwards of three millions of people to its present inhabitants.

17. It may be argued that the four counties named, are purely exceptional in the density of their population, in consequence of the metropolis, the town of Geelong, the gold fields of Ballaarat, and Mount Alexander, being included within their limits; and that a population similarly dense could not be expected to exist throughout the length and breadth of the colony, for probably generations to come. Taking Dalhousie, therefore, a county depending almost entirely upon agriculture, not being upon the sea coast, possessing neither large towns nor gold fields of any importance, but containing 17·2 persons to the square mile; which is also nearly the average of the more thickly inhabited portions of Victoria already alluded to as being about equal to the area of Scotland; and supposing a similar population to be spread over the whole colony, with the exception of the scrub-covered portions of the Wimmera already mentioned, it will be found that Victoria would contain upwards of one million (1,182,586) of inhabitants without increasing the degree of proximity of person to person now existing in the comparatively speaking sparsely populated county of Dalhousie.

Comparative Rate of Births, Marriages, and Deaths, in Victoria and England.

18. The annual Birth, Death, and Marriage-rates of Victoria, when compared with those of Great Britain, are uniformly in favor of the colony. Thus, on examining the results recorded in the two countries over a period of seven years, from 1854-1860, both inclusive, we find relatively to the mean populations existing throughout each year, that in Victoria the marriages have been slightly over, and in England somewhat under one per cent. The births in Victoria have been 3·8 per cent., and in England 3·4 per cent.; but the deaths in Victoria have been 1·94 per cent. only, while in England they have been 2·2 per cent. The following table shows the result for various years:—

TABLE III.—Victoria and England compared in regard to the proportions of Births, Marriages, and Deaths, to the Mean Population.

Years.	Proportion to every 100 of the Mean Population living throughout the Year.					
	Births.		Marriages.		Deaths.	
	Victoria.	England.	Victoria.	England.	Victoria.	England.
1854	2·815	3·407	1·407	·858	2·341	2·352
1855	3·523	3·380	1·013	·810	1·955	2·266
1856	3·785	3·452	1·081	·837	1·504	2·050
1857	4·061	3·435	1·051	·824	1·732	2·175
1858	4·126	3 357	·934	·799	1·864	2·303
1859	4·294	—*	·922	—*	1 798	—*
1860	4·237	—	·807	—	2·292	—
Yearly average proportions..	3·834	3·406	1·031	8 26	1·941	2·229

Actual Births, Marriages, and Deaths, over Seven Years in Victoria.

19. The marriages in Victoria from 1854–1860, have ranged from 3,762 in 1854, to 4,770 in the year 1859. In 1860 they declined to 4,351. This number is, however, above the annual

* The latest Report of the English Registrar-General which has reached the colony up to this period, is the one dated the 30th June, 1860, referring to the year 1858.

mean of marriages over the whole seven years. The births over the same period have steadily increased from 7,527 in 1854, to 22,854 in 1860; and the deaths also have shown a similar increase in gross results. In the past year (1860) it will be observed that the deaths numbered twenty-seven per cent. over those of the previous year; this resulted mainly from the prevalence of epidemic attacks of scarlatina and measles, which diseases were previously almost unknown in the colony. The attention of the Central Board of Health has been earnestly directed to this subject, and the precautions recently urged to be taken, will, it is trusted, modify the influence of similar zymotic diseases in future. In Table IV. are given the number of Births, Deaths, and Marriages, registered during the last seven years.

Table IV.—Victoria.—Births, Marriages, and Deaths, 1854–1860.

Years.	Births.	Marriages.	Deaths.
1854	7.527	3,762	6,258
1855	11,919	3,846	6,614
1856	14,419	4,116	5,730
1857	17,490	4,524	7,455
1858	19,963	4,552	9,016
1859	22,209	4,770	9,299
1860	22,854	4,351	12,361
Total in 7 years	116,381	29,921	56,733

Mortality of Children in relation to Climate.

20. It is always found that the mortality of very young children in any country has an intimate relation with the climatic influences to which they are subject. In fact, all other conditions being equal, no better or severer test could be found of the salubrity of a locality than the degree of health enjoyed by its infant population. Many have supposed the climate of Victoria to be particularly unfavorable to tender babes, and there is no doubt the mortality is too great, and that much of it is preventable; but the same may be as truthfully said of every other nation that has published accurate and comprehensive vital statistics. In the matter of Infant Mortality, Victoria will bear favorable comparison with Great Britain. As I have said elsewhere, "whatever room there may be for the exercise of common sense and medical skill in reducing the annual rate of destruction of infant life, the actual amount of mortality per cent. is not so remarkably high as that

obtaining in many of the city and rural districts of the mother country. The Melbourne metropolitan district may compare favorably, not only with the district of London, but even with the counties of Cambridge, Bedford, Norfolk, and Buckingham, while the rest of the colony ranks with some of the most favored parts of our parent isle." *

21. In Great Britain the most fatal months are those of winter. In Victoria this sad distinction is reserved for the months of summer. The differences in the rate of mortality for each month of the year are strikingly exhibited in the following groups of deaths of children under the age of twelve months, observed over a period of three consecutive years:—

TABLE V.—VICTORIA.—DEATHS OF INFANTS, AND PROPORTIONS PER CENT. IN EACH MONTH.

Months.	Deaths of Infants from all causes in each Month.	Proportions per Cent.
July	378	5·98
August...	294	4·65
September	274	4·33
October	300	4·74
November	423	6·69
December	643	10·16
January	837	13·23
February	825	13·04
March	879	13 89
April	681	10·77
May	415	6·56
June	377	5·96
Total of all the months during three years	6,326	100·00

22. The months of lesser infantile mortality are generally May, June, July, August, September, and October, when the average daily temperature in Melbourne is less than 57·8° Fahrenheit, which is the yearly mean of Melbourne,† and is about seven degrees above the London annual mean. The months of greater mortality are those of a temperature in excess of the mean, namely, November, December, January, February, March, and April.

* *Facts and Figures*, vol. ii. page 8.

† The annual mean (59° Fahrenheit) as published in my *Statistical Register of Victoria* in 1854, p. 414, was the result of observations made from sunrise to sunset only, throughout several years, but the mean given above, was obtained at the Melbourne Observatory during the last two years, from day and night hourly observations.

23. The ratio of zymotic diseases among infants has been found to increase in the latter of the two divisions of the year as compared with the former, from 14 to 86 per cent. of their total deaths, or in other words, "the deaths from epidemic and endemic causes are in the half year of 'greater mortality' when the average monthly temperature is nearly 65 degrees Fahrenheit, six-fold as many as those which occur in the other half of the year, or period of 'lesser mortality,' when the mean monthly temperature is only a little above 53 degrees Fahrenheit."*

24. With respect to both adults and children, the period of greater mortality, or summer half of the year, is not so unfavorable to those whose respiratory organs are affected as to those suffering from, or predisposed to, most other diseases; the period of greater mortality from chest diseases being the cool or winter half of the year.

Dwellers in Tents.

25. Further, in reference to climate it is worthy of notice, that in 1857 there were 140,892 persons out of a total 410,766, or upwards of one-third of the population of Victoria, living in tents. Now, without taking into consideration the occupations of those thus exposed to very sudden changes at all seasons of the year, it is highly indicative of the comparative healthiness of the colony that notwithstanding such a large proportion of the inhabitants being subject to this exposure, a lesser rate of mortality should obtain in Victoria, than is found to prevail among the dwellers in the more substantial habitations of the mother country.

Physical strength of the Population.

26. The physique of a population is an important matter for recognition in the discussion of many social and political questions; and one element claiming special regard, is the varying intensity found on grouping human units into periods of age. Thus, with regard to Great Britain it was determined in 1851, that there were 451 persons under the age of 20, and 72 persons over the age of 60, or in all 523 persons in every thousand of the total population of both sexes who would ordinarily be dependent on the remaining 477. With respect to Victoria, on the other hand, we find by a similar process that, in 1857 there were only 396 under 20 and over

* *Facts and Figures*, vol. ii, page 18.

60, out of every thousand of all ages; leaving 604 persons between 20 and 60, to aid and protect the lesser number of youthful and aged. Or, again, if we calculate upon the supposition that the dependent classes are limited to children under 10 years, and to persons of 70 years of age and upwards, and that the population between 10 and 20, and between 60 and 70 support themselves, then the burden of the dependent classes (under 10 and over 70) falls upon those who are between the ages of 20 and 60. It will be instructive to see how the populations have varied in this regard between the censuses of 1854 and 1857. In 1854 the children under 10 years of age numbered 46,170, and the persons of 70 years old and upwards numbered 422, making a total of 46,592, to be supported by persons between 20 and 60, who numbered 146,937, and who had thus to sustain a class equal to 31·7 per cent. of their own numbers. According to the census of 1857, which is the latest date up to which the ages have been classified, the persons between 20 and 60 years of age, or supporting classes, numbered 239,971, which was an increase of about 63 per cent., but during the same period the dependent classes had increased upwards of 94 per cent., the children under 10, numbering 89,652, and the people over 70 numbering 840, or a total of 90,492 non-effective persons who had to be supported by the 239,971 persons already named, the latter being thus charged with the sustenance of a class numbering nearly 38 per cent. of themselves. As, since the year 1857 the colony has been more indebted to births and less to immigration than in former years for the increase of its population, it is probable that the census of April 1861, will show a still greater increment of the dependent as contrasted with the self-supporting classes of the community. In Great Britain, at the census of 1851, the former amounted to 57 per cent. of the latter, and although it may be long before the earnings of the supporting classes of Victoria will be taxed with such a large proportion of dependents as this, yet the natural development of parental and filial responsibilities should not be overlooked, in considering the causes of increased pressure on the means of subsistence among colonial families.

27. While Victoria has considerably more male adults at the soldiers' age (20 to 40,) in proportion to the total population than Great Britain possesses, so in regard to females coming below and within the child-bearing periods of life, Victoria has likewise the

advantage, for whereas the females in Great Britain (in 1851) under the age of 40 were 753 in a 1000 of all ages; the females in Victoria under 40 comprise 900 out of every 1000 of all ages. To illustrate this the following table has been compiled, in which the probable limit of human life is fixed at 100 years. This period is divided into 5 lesser periods of 20 years each, and the number of males and females living between each of these periods in proportion to every 1000 of the total population, has been given both to Victoria and Great Britain, so that the comparative strength of the population in both countries may be at once perceived:—

TABLE VI.—Victoria.—Comparison of Ages of Males and Females with those of Great Britain.

Vicennial Periods.	Males and Females in 1000 at different periods.			
	Males.		Females.	
	Victoria.	Great Britain.	Victoria.	Great Britain.
Under 20 years ...	296	461	472	441
20 years to 40	554	307	429	312
40 „ 60	136	165	89	168
60 „ 80	11	62	8	71
80 „ 100	3	5	2	7
	1000	1000	1000	·999

28. In April 1857, there were enumerated in Victoria 55,841 wives who were under 45 years of age, apportioned in the following quinquennial periods:—4 under 15 years of age; 1,912 between 15 and 20; 12,812 between 20 and 25; 15,856 between 25 and 30; 12,026 between 30 and 35; 8,090 between 35 and 40; and 5,141 between 40 and 45 years of age. In the year ending 30th June, 1857, the number of births registered was 15,937, of which 249 were recorded as illegitimate, leaving 15,688 children born in wedlock, or one to about every 3·56 married women under 45 years old.

29. In Great Britain it has been ascertained that the children born annually, are in the proportion of 224 to every 1000 married women between the ages of 15 and 55. In 1857 there were 60,460 wives in Victoria between those periods of age, and the proportion of children born to every 1000 of these within the year was 263.

OCCUPATIONS OF THE PEOPLE.

Occupations.

30. The occupations of the people as returned by the census of 1861, have not yet been abstracted, but the following table will show the relative proportions existing at the time of taking the three previous censuses of 1851, 1854, and 1857 :—

TABLE VII.—Victoria.—Occupations of the People in 1851, 1854, and 1857.

Classes.	1851.	1854.	1857.
Governmental, Professional and Trading Classes	8·16	8·68	5·58
Manufacturing and Laboring Classes	12·21	14·07	11·33
Gold-mining Class	Nil.	15·35	20·07
Pastoral and Agricultural Classes	15·05	6·11	9·01
Personal offices, Domestic Servants, &c.	5·96	9·00	9·27
Miscellaneous (including women and children)	58·62	46·79	44·74
	100·00	100·00	100·00

Proportions per cent. of the Classes.

31. It will be observed that the Governmental, Professional and Trading classes remained remarkably steady in their proportions to the total throughout the first two periods, but that in 1857 there was a decrease of upwards of three per cent. in that proportion. The Manufacturing and Laboring classes reached their highest proportion to the total in the middle period, but had fallen in 1857 even below the level of 1854. The census of 1851 having been taken prior to the discovery of gold in that year, the Gold-mining class could not be recognized in the census returns until 1854, when it numbered upwards of 15 per cent. of the whole population. By 1857 it embraced a fifth of the population. The Agricultural and Pastoral classes had reached their highest proportion, in relation to the total, in 1851, but the influx of persons following other pursuits caused that proportion to decline more than half by 1854. A revival of the agricultural interest caused them to increase 50 per cent. between 1854 and 1857, at which latter period the proportion of the class to the total population reached 9 per cent. In regard to Personal offices, the proportion of 5·96 per cent

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consisted wholly of domestic servants in 1851, while in 1854 only 4½ out of the 9 per cent. in the table, consisted of that class, and in 1857 about 5 per cent. only were domestic servants, the remaining 4·27 per cent. being composed of persons ministering to others in the dealing of food and the making-up of articles of dress; so that in 1857 the proportion of domestic servants to the total population was rather less than in 1851. Paupers, Pensioners, and Patients in Hospitals, &c., were not tabulated separately until 1857, when their total number amounted to 1077.

Military and Volunteers.

32. The number of Military stationed in the colony has fluctuated of late, in consequence of the New Zealand War. At the commencement of the year there were 147 of the Line, and 27 of the Royal Engineers. The Volunteer movement here as in England has been very spirited. The Volunteers in 1860 were as follow:—

Victorian Artillery	419
Geelong Volunteer Rifles	235
Mounted Rifles	194
R. V. Yeomanry Cavalry	118
Naval Volunteers	201
Volunteer Rifles	2,781
	3,948

33. The cost of the Volunteers to the colony for the year 1860 was £15,342 12s.

PRODUCTION.

Pastoral Industry.

34. The propagation of Live Stock, for which the climate and rich natural pasturage of Victoria offer eminent advantages, was the first colonial interest which attained great magnitude. The extent of land occupied for grazing was approximately ascertained in 1856 to amount to 32,326,468 acres. In that year 1,174 licenses were issued; and in 1860, in spite of the quantity of land sold during the previous four years, the number of squatters' occupation licenses had increased to 1,223. The following table shows the quantity of Sheep, Cattle, and Horses enumerated at

various periods; the growth of the pastoral interest from period to period being thus shown:—

TABLE VIII.—VICTORIA.—LIVE STOCK, 1851-1860.

Years.	Sheep.	Cattle.	Horses.
1841	782,283	50,837	2,372
1846	1,792,527	231,602	9,289
1850	5,318,046	346,562	16,733
1855	5,332,007	481,640	27,038
1860	5,794,127	683,534	69,288

35. The exported produce of pastoral industry from the foundation of the colony is given in the following table, by which it will be seen that the aggregate shipments of Wool, Tallow, Hides, and Skins, have amounted, in money value, from 1837 to the end of 1860, to not less than £20,358,306.

TABLE IX.—VICTORIA.—EXPORTS OF WOOL, TALLOW, HIDES AND SKINS, 1837-1860.

Year.	Wool.		Tallow.		Hides and Skins.
	Quantity.	Value.	Quantity.	Value.	Value.
	lbs.	£	lbs.	£	£
1837	175,081	11,639	2,240	28	22
1838	320,383	21,631	18,114	489	117
1839	615,603	45,226	18,552	396	249
1840	941,815	67,902	48,048	953	251
1841	1,714,711	85,735	44,900	786	561
1842	2,828,784	151,446	78,400	975	801
1843	3,826,602	201,383	117,258	1,700	743
1844	4,326,229	174,044	961,032	13,907	989
1845	6,841,813	396,537	846,155	12,267	1,913
1846	6,406,950	351,441	250,880	3,049	2,256
1847	10,210,038	565,805	1,255,744	15,802	3,267
1848	10,524,663	556,521	3,013,808	37,968	2,066
1849	14,567,005	574,594	7,800,716	100,261	2,184
1850	18,091,207	826,190	10,056,256	132,863	5,196
1851	16,345,468	734,618	9,459,520	123,203	7,414
1852	20,047,453	1,062,787	4,469,248	60,261	13,306
1853	20,842,591	1,651,871	982,833	13,252	11,811
1854	22,998,400	1,618,114	1,340,752	22,750	29,465
1855	22,584,234	1,405,659	1,376,816	29,117	41,871
1856	21,968,174	1,506,613	1,970,976	35,980	72,103
1857	17,176,920	1,335,642	4,843,216	62,363	191,828
1858	21,515,958	1,678,290	2,275,056	43,987	106,527
1859	21,660,295	1,756,950	548,352	10,354	172,446
1860	24,273,910	2,025,066	788,144	18,269	144,236
Totals ...	290,804,287	18,805,704	52,567,016	740,980	811,622

36. Besides the articles mentioned in the above table, horses, sheep, and cattle have at different periods been sent in considerable numbers, either to the Indian market, to the adjacent colonies, or elsewhere, and bones, horns, and hoofs have also formed a constant and important article of our exportable produce.

Acclimatisation.

37. In addition to other efforts towards the development of the capabilities of the colony, very energetic exertions have been made recently to secure the introduction and acclimatisation of foreign animals. A new and valuable site in the Royal Park at Melbourne has been granted by the Government to the Acclimatisation Society; and money-aid, in addition to a large sum contributed by private individuals, has been voted by the Legislature, to the extent of £1000 for the purpose of fencing and building, £2000 for a further supply of pure Alpacas, £500 for the introduction of the Salmon, and £500 for other animals.

38. Consignments of valuable animals are already taking place from England, France, India, and other distant countries. The following are already in the possession of the Acclimatisation Society, and have been placed in the public gardens in and around Melbourne:—

3 Camels (besides about twenty others absent on the Exploring Expedition).
3 Ceylon elks.
3 Indian spotted deer.
2 Do. hog do.
19 Fallow do.
37 Llama Alpacas (cross breed).
3 pure Alpaca bucks.
8 Angora goats.
3 Abyssinian sheep.
1 Bengal do.
16 Chinese do.
1 Cape do.
1 Wild boar.
10 Monkeys.
1 Jackall.
1 Screwtail.
2 Mongooses.
1 Tiger cat.
1 Porcupine.
7 Opossums.
3 Flying opossums.
1 Wombat.
3 Native bears.
5 Kangaroos.
3 Kangaroo rats.
9 Emeus.
1 Wild turkey.
3 Indian peafowls.
1 Marabout crane.
3 Native companions.
1 Indian pelican.
12 Gold pheasants.
17 Silver do.
21 English do.
4 Mallee hens.
3 Indian partridges.
2 English do.
8 Californian quail.
5 Australian do.
2 Fiji doves.
2 Ceylon do.
2 Manilla do.
21 Turtle doves.
3 Hawks.
6 Eagles.
9 Owls.
4 Black swans.
8 White swans.
6 Canadian geese.
17 Chinese do.
2 White-throated do.
2 Egyptian do.
2 Cape Barren do.
20 Muscovy ducks.
16 English wild do.
5 Shell do.
4 Carolina do.
10 Call do.
1 New Zealand do.
11 Curassows.
2 Curlews.
20 Thrushes.
12 Blackbirds.
10 Goldfinches.
8 Linnets.
5 Java sparrows.
13 Indian finches.
2 Gigantic kingfishers.
2 Magpies.
8 Ortolans.
1 Skylark.
12 Canaries.

And a quantity of carp, tench, dace, roach, and goldfish.

39. In addition to these, several English birds have been set free in various parts of the colony, with such success, that in the words of the Report of the Committee of the Acclimatisation Society:—"The thrush, skylark, blackbird, and probably the starling may now be considered permanently established amongst us—the three former being heard in all directions." The following have been placed in different localities:—

18 Canaries.	9 Pheasants.	38 Thrushes.
22 Blackbirds.	20 Skylarks.	8 Starlings.

Gold Mining.

40. The District of Port Phillip (subsequently named Victoria, in honour of Her Majesty), was separated from New South Wales on the first day of July, 1851, and a few weeks after that date the Victorian Gold Fields were discovered. By the end of December of the same year Gold to the value of upwards of half a million sterling had been found, and the total yield for each succeeding year is approximated to in the following table:—

Table X.—Victoria.—Exports of Gold, 1851–1860.

Year.	Quantity.			Total Value, at £4 per oz.
	ozs.	dwts.	grs.	£
1851	145,146	14	16	580,587
1852	2,724,933	5	1	10,899,733
1853	3,150,020	14	16	12,600,083
1854	2,392,065	9	19	9,568,262
1855	2,793,065	8	16	11,172,261
1856	2,985,695	17	0	11,942,783
1857	2,761,528	8	0	11,046,113
1858	2,528,187	19	12	10,112,752
1859	2,280,675	13	0	9,122,702
1860	2,156,660	12	0	8,626,642
Total ...	23,917,980	2	8	95,671,918

41. The gold referred to in the above table was regularly passed through the Customs, but a considerable quantity has also, at various times, been taken from the colony by private hand; this latter has been computed to have amounted up to the end of 1860 to upwards of two millions of ounces (2,067,064 ozs.), which, added to the quantity passing through the Customs, would give a total of 25,985,044 ounces, of a value, at 80s. per ounce, of £103,940,176.

Agriculture.

42. Prior to the discovery of gold, agriculture had made considerable progress in Victoria. In the year 1850, no less than 52,185

acres were under cultivation, while the population was only 76,000. Owing to the gold discoveries, the cultivation of the land languished for a time, only 34,651 acres having been placed under cultivation in 1854, when the population amounted to 236,798; but since that date a fresh impulse has been given to agricultural pursuits, every subsequent year presenting an increased breadth of land under tillage. Thus in 1857 there were 179,982 acres returned as under cultivation, the population then amounting to 410,766, and at the end of March, 1861, with a population of 540,000 there were 419,592 acres under cultivation. The principal crops produced have been wheat, oats, barley, potatoes, and hay. The number of acres which have been placed under each of these crops during each year from 1851, the year of the gold discovery, to the present year (1861) will be found in the following table:—

TABLE XI.—VICTORIA.—PRINCIPAL CROPS, 1851-1861.

Year ending 31st March.	Total number of acres under cultivation.	Number of acres of land under				
		Wheat.	Oats.	Barley.	Potatoes.	Hay.
1851	52,176	28,567	4,092	3,831	2,837	12,782
1852	57,296	29,623	6,426	1,327	2,375	16,745
1853	36,662	16,823	2,947	411	1,978	14,045
1854	34,651	7,553	2,289	411	1,636	21,645
1855	54,715	12,827	5,341	691	3,297	31,443
1856	115,135	42,686	17,800	1,548	11,017	40,111
1857	179,982	80,154	25,024	2,233	16,281	51,910
1858	237,729	87,230	40,222	5,409	20,697	75,536
1859	298,959	78,234	77,526	5,322	30,026	86,162
1860	358,728	107,093	90,167	4,102	27,622	98,570
1861	419,592	161,232	86,260	4,119	24,829	90,860

43. During the same period of eleven years, the average produce of wheat has been 22·7 bushels per acre; of oats 27·2 bushels; and of barley 25·5 bushels. Of potatoes the average produce has been 2·65 tons, and of hay 1·63 tons per acre.

YEARLY CONSUMPTION OF WHEAT, AND PROPORTION GROWN IN THE COLONY.

44. In the year previous to the gold discoveries, the quantity of wheat produced in the colony had been within less than a tenth of the requirements of its then small population; but in consequence of the falling off in agriculture just alluded to, this proportion fell off year by year, until in the years 1854 and 1855, only about a tenth of the quantity necessary for use was grown in the colony, the remaining nine-tenths being imported; since then,

however, the quantity of Victorian grown wheat has each year with the single exception of 1859, borne a much larger proportion to the total quantity available for the requirements of the colonists. By a careful calculation, based upon the wheat grown in the colony, and the excess of imports over exports, of wheat, flour and bread, together with the mean population living throughout each year, I have elsewhere shown* that the quantity of wheat necessary for yearly individual consumption ranges from seven to eight bushels per head. The figures exhibiting the approximate quantities that have been available for individual consumption for the last ten years, as well as those denoting the proportions of such quantities as have been grown in the colony, are given in the following table, the former since 1857 being given both inclusive and exclusive of the Chinese, which people, as consumers of rice in lieu of bread, it is necessary to take into account in order to arrive at a correct estimate:—

Table XII.—Victoria.—Proportion of Wheat Grown in the Colony, and Quantity from all Sources for Individual Consumption, 1851–1860.

Years.	Proportion per cent. of Wheat grown in Victoria, to the total quantity available for use.	Number of bushels of Wheat available for individual consumption.	
		Inclusive of Chinese.	Exclusive of Chinese.
1851	71·95	8·90	—
1852	37·77	14·61	—
1853	25·02	10·20	—
1854	10·02	5·75	—
1855	10·06	7·35	—
1856	33·92	8.88	—
1857	48·69	8·87	9·54
1858	54·58	6·85	7·38
1859	44·45	6·80	7·40
1860	59·46	7·16	7·66

Minor Crops.

45. In addition to the principal crops already noted, green fodder for cattle, consisting generally of barley, oats, maize, or sorghum, cut without being allowed to ripen, comes next in importance. During the past season 6,058 acres were devoted to this description of produce, and 11,700 acres were returned as having been laid down in permanent artificial grasses. An in-

* See *Statistical Notes of the Progress of Victoria from the foundation of the Colony, 1835–1860*, page 50, 4to. Melbourne: Ferres, 1861.

creased breadth of soil has also been each year devoted to minor crops, such as maize and sorghum for grain, rye and bere, pease, beans, millet, turnips, mangel-wurzel, beet, carrots, parsnips, cabbage, onions, and tobacco, all of which thrive luxuriantly in Victoria. The demand for fruit and vegetables, and the eminent capabilities of the soil and climate for bringing such productions to perfection have had the effect of causing about 7,300 acres to be laid out as orchards and market gardens, making an increase in three years of nearly 2,500 acres, or upwards of a third.

The Vine.

46. The cultivation of the Vine has for some time past excited much attention, and several Joint-Stock Companies have been projected with a view to the advancement of this branch of industry. The present year's returns show 1,133 acres of vineyards already in existence, which in addition to 8000 hundred-weight of grapes sent to market, produced 11,643 gallons of wine and 260 gallons of brandy. The cuttings in a large number of instances were only recently planted, and therefore this result is as great as could be reasonably expected.

Manufactures.

47. The efforts of the people of Victoria have hitherto naturally been exerted rather in the production of the raw material than in manufacturing industry, but the latter has not been altogether neglected, as the returns for 1860 exhibit no less than 474 mills and manufactories of various kinds in active operation. Of these, those connected with or dependent upon agriculture numbered 129, and consisted of 94 mills for grinding and dressing grain, 86 of which were worked by steam, 7 by water and 1 by wind, 1 oatmeal manufactory, 3 bread and biscuit manufactories, 20 agricultural implement manufactories, 7 steam chaff-cutting machines, and 4 bone-manure manufactories. Those working upon raw materials, the production of the pastoral interest, numbered 67, and consisted of 28 tanneries, 21 soap and candle manufactories, 15 fellmongers and curriers, 2 woolstaplers and washers, and 1 woollen flock factory. Works for the manufacture or preparing of food, the raw material not being the produce of agriculture, and for the manufacture of articles of drink, amounted to 77, as under:—1 sugar refinery and distillery, 2 steam coffee and spice mills, 2 ice

manufactories, 38 breweries, 25 ginger-beer and soda-water manufactories, 7 cordial manufactories and 2 cider manufactories. The number of works for the making of building materials and for carrying on plastic manufactures was 127, as follow:—64 sawmills, 8 limekilns, 50 brick-yards, 4 drain-pipe and tile manufactories, and 1 pottery. The machine manufactories and those for working in brass and iron numbered 33, consisting of 20 iron, brass, and copper foundries, 2 iron rolling factories, 6 millwrights' and machinists', 1 saw making, 1 wire working, 1 chain, 1 lead pipe, and 1 boiler manufactory. The following miscellaneous works and manufactories were also returned, 21 coach factories, 1 railway carriage factory, 3 organ and pianoforte builders', 6 ship and boat builders' yards, 5 gasometers, 2 electro platers', 2 curled hair factories, and 1 scale makers'.

Inventions.

48. The total number of patents issued in the colony amounts to 417, of which 328 are now in force. They are as follows:—

Patents issued in Victoria, in force on the 24th September, 1861.

Class 1.	Agricultural implements, &c.	14
„ 2.	Metallurgy, manufacture of metals and instruments, &c. ...	121
„ 3.	Textile manufactures and machines for preparing fibrous substances, &c.	3
„ 4.	Chemical process, manufactures and compounds including medicines, dyeing, color-making, distilling, soap and candle making, mortars, cements, &c.	21
„ 5.	Calorifics, comprising lamps, fire-places, furnaces, stoves, preparations of fuel, ventilators, &c.	9
„ 6.	Steam and gas-engines, boilers and furnaces, &c.	12
„ 7.	Navigation and maritime implements, vessels, diving-apparatus, life preservers, &c.	6
„ 8.	Mathematical, philosophical and optical instruments, clocks, &c.	4
„ 9.	Civil engineering and architectnre, and apparatus employed on railroads, bridges, waterworks, &c.	18
„ 10.	Land conveyances, roads, vehicles, wheels, &c.	7
„ 11.	Hydraulics and pneumatics, water-wheels, windmills, apparatus for raising or delivering fluids, &c.	15
„ 12.	Lever, screw, and mechanical power, applied to pressing, weighing, raising and moving weights, &c.	1
„ 13.	Grinding mills, gearing, grain mills, and mechanical movements and horse-power, &c.	6
„ 14.	Lumber machines for dressing wood, &c....	10

Class 15.	Stone and clay manufactures, pottery, glass, bricks, stone, dressing cements, &c.	24
„ 16.	Leather dressing and manufactures, boots, harness, &c. ...	4
„ 17.	Household furniture, domestic implements, feather dressing, mattrasses, &c.	14
„ 18.	Fine arts, music, painting, sculpture, engraving, books, paper, printing, binding, jewellery, &c.	7
„ 19.	Fire-arms, implements and munitions of war, &c. ...	20
„ 20.	Surgical and medical instruments, trusses, bathing apparatus	1
„ 21.	Wearing apparel, toilet articles, and instruments for manufacturing them, &c....	4
„ 22.	Miscellaneous	7
		328

INTERCHANGE.

Internal Communication.

49. Scarcely eight years since there was but one stone bridge and a few wooden bridges in the colony, and not a mile of metalled road existed in Victoria outside the city of Melbourne. The Central Road Board was established in 1853, and under its auspices, and the subsequently formed Department of Roads and Bridges, the labors of the Government in this branch of the public service, up to 1861 inclusive, have resulted as follows:—

Expenditure on Roads and Bridges by the Government of Victoria, from 1st January, 1851, to 31st December, 1861.

Works executed, including Maintenance of every description.

Miles.	Chains.		
450	44	Metalled road completed.	
83	21¾	Formed, drained, and partially metalled.	
67	56½	Formed and drained.	
485	66	Cleared.	
35,377 rods		Fencing.	
	407	Bridges.	
	60	Fords.	
	10	Punts.	
	54	Tolls.	
		Total Cost being	£4,540,047
		Estimated Cost of Works in 1861, in progress of construction, &c.	198,944
		Grants in Aid of District Road Boards for construction of Local and Cross Roads	533,629
		Total Expenditure to 31st December, 1861 ...	£5,272,620

50. The Grants in Aid to the District Road Boards throughout the colony are supplemented by local contributions in the shape of rates. Some particulars respecting these Road Boards have been already given. (*See* par. 13.)

Land Carriage.

51. Previously to the discovery of the gold fields in 1851, land carriage was almost wholly performed by bullock drays, at rates varying for each place according to the season. The prices paid by Government from 1852 to 1861 for the transport of forage and stores will be found in the following table, which indicates an almost incredible change in the cost of conveyance.

Table XIII.—Victoria.—Cost of Land Carriage in the Years 1852, 1856, and 1861.

Rates of Carriage for Goods from Melbourne to	1852.	1856.	1861.	
	£	£	£	s.
Sandhurst, 106 miles ...	120	10	4	0
Avoca, 120 „ ...	150	12	5	0
Castlemaine, 71 „ ...	120	9	3	0
Ballaarat, 78 „ ...	120	7	2	10
Carisbrook, 100 „ ...	150	10	4	0
Beechworth, 166 „ ...	160	20	7	0

Electric Telegraph.

52. The first line of Electric Telegraph commenced in Victoria was that from Melbourne to Williamstown in 1853. It was completed and opened on the 1st of March, 1854, and was the first line laid in the Southern Hemisphere, the second instance being in Chili, where it is reported that a line was subsequently opened between Copiapo and Coquimbo. There are now 1504 miles of telegraphic wire in use in Victoria; the apparatus employed is Morse's Electro Magnetic Telegraph. The total expenditure for the construction of telegraphs, including stations, instruments, &c., up to the end of 1860, amounted to £163,475 14s. 8d.

Postal Communication.

53. During the last ten years no less than 36,092,981 letters and 28,417,191 newspapers have passed through the various

post-offices of the colony. In 1851 there were 44 post-offices, and through these there were forwarded 504,425 letters, and 456,741 newspapers. In 1860 the number of post-offices had increased to 311; the letters transmitted amounted to 8,116,302, and the newspapers to 5,683,023. The following table shows the number of letters and newspapers, both inland and ship:—

TABLE XIV.—VICTORIA.—POSTAGE, 1860.—NUMBER OF LETTERS AND NEWSPAPERS PASSED THROUGH THE POST-OFFICE.

	Letters.	Newspapers.	Total.
Inland	6,001,014	3,915,137	9,916,151
Ship	2,115,288	1,767,886	3,883,174
Total	8,116,302	5,683,023	13,799,325

54. The income of the Post-office for 1860 was £120,472 12s. 5d., and the expenditure £133,064 11s. 3d.

SHIPPING.

55. The number and tonnage of vessels which were entered inwards and cleared outwards in Victorian ports from and to the United Kingdom, British Possessions, and Foreign Countries during the year 1860, are given in the following table:—

TABLE XV.—VICTORIA.—VESSELS INWARDS AND OUTWARDS IN 1860.

1860.	United Kingdom.		British Possessions.		Foreign Countries.		Total.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.	Number.	Tons.
Entered inwards........	218	87	1,452	289,314	144	80,341	1,814	581,642
Cleared outwards........	68	69,215	1,514	340,473	259	189,449	1,841	599,137
Inwards in excess.......	—	—	62	51,159	115	109,108	27	17,495
Outwards in excess......	150	142,772	—	—	—	—	—	—

56. In 1850 the number of ships inwards was 555, of an aggregate burden of 108,030 tons; and during the same year 508 ships of 87,087 tons burden were cleared outwards. By comparing these figures with those given in Table XV. for the year 1860, it will be seen that in ten years the tonnage inwards has multiplied nearly six-fold, and that outwards, has increased seven-fold.

Imports and Exports.

57. The value of Imports from and Exports to the United Kingdom, British Possessions, and Foreign Countries during the year 1860, will be found in the following table:—

TABLE XVI.—Victoria.—Imports and Exports in 1860.

1860.	United Kingdom.	British Possessions.	Foreign Countries.	Total.
	£	£	£	£
Imports	9,564,093	3,484,542	2,045,095	15,093,730
Exports	9,346,619	3,221,101	394,984	12,962,704
Excess of Imports ...	217,474	263,441	1,650,111	2,131,026

58. The Imports in 1850 were valued at £744,925, and the Exports at £1,041,796, the former being at the rate of £10 9s. 3d. per head, and the latter at the rate of £14 12s. 8d. per head to each individual of the then existing population. The Imports, as shown in the above table, divided amongst the mean population of 1860 give £27 19s. 9d. per head, and the Exports similarly divided give £24 0s. 8d. per head to each individual living in the colony during 1860.

59. The nature of the external trade of the colony is indicated by the following table, which specifies the principal articles imported and exported during 1860, with the value of each:—

Table XVII.—Victoria.—Principal Articles Imported and Exported in 1860.

Imports.		Exports.	
Articles.	Value.	Articles.	Value.
	£		£
Apparel and Slops ...	586,570	Bones	2,690
Beer and Cider ...	614,258	Gold	8,624,860
Flour	504,302	Hides	130,269
Grain	844,775	Horns and Hoofs ...	4,164
Haberdashery and Drapery ...	1,597,301	Horses and Cattle ...	94,575
		Sheep	63,043
Hardware	382,444	Skins	13,967
Leather (Boots and Shoes, &c.) ...	726,555	Provisions, salted ...	18,449
		Tallow	18,269
Spirits	479,426	Wool	2,025,066
Timber	345,176	All other Articles ...	1,967,352
Wine	231,636		
All other Goods ...	8,781,287		
Total	15,093,730	Total	12,962,704

Railways.

60. The commencement of Railways in Victoria dates but from the year 1853. It was apprehended that with a population so limited in number and so unsettled in habitation and pursuits, it would be unsafe to rely upon the commercial success of these important enterprises; and it was urged by influential public men that such works should be regarded as national undertakings, the indirect effects of which in opening up the country for settlement would abundantly compensate for any loss which as a commercial speculation they might entail.

61. In this view much attention was devoted to the subject by the Legislature—and as the result of a protracted and elaborate investigation, the Government has undertaken the construction of main lines connecting the most important gold fields with the seaboard, leaving to private enterprise the short lines in the neighbourhood of Melbourne, and in accordance with the same policy, the State has purchased from the Geelong Railway Company their Line (45 miles), which now forms an integral portion of the

Government Railway system. After a large share of consideration had been given to the relative advantages of the cheap system operating in America, and the more costly and substantial system of England, the latter was adopted with its latest improvements. It has also been the policy of the Legislature to aid private enterprise by the donation of such available Crown Land as might be needed for railways.

62. The first Line actually commenced was a private one, connecting Melbourne and Hobson's Bay, bringing goods from the shipping in the port, a distance of $2\frac{1}{2}$ miles, to within close proximity of the merchants' stores in Melbourne, and providing appliances for the loading and discharge of cargo, inferior to few in England. A pier of 2,180 feet in length receives ships of the largest burden alongside, and by means of steam cranes, the cargoes are, with great rapidity, moved directly from the ships' hold into the railway trucks, which deposit them under extensive sheds in Melbourne, to wait the convenience of the consignees.

63. The other private lines around Melbourne connect the city with the populous localities of St. Kilda, Brighton, Richmond, Prahran, Hawthorn, &c., and how far this railway accommodation was needed is apparent from the fact, that within twelve months, upwards of 4,200,000 passengers travelled on the four short lines constructed by private enterprise.

64. Of the Government lines no portion of that to Ballaarat has yet been opened. Of the Sandhurst line 24 miles (to Sunbury) had been opened for traffic on the date to which the following table is made up (30th June, 1861), since which date an additional length of $24\frac{3}{4}$ miles (to Woodend) has been opened for passengers only; the arrangements for goods traffic not being complete. It should be observed that, hitherto, only a small proportion of the goods traffic between Melbourne and the gold fields has passed over the railway, in consequence of the limited extent opened; and it is confidently anticipated that the revenue will increase in a much higher ratio than the length.

65. It is stated that on most of the private lines now in operation, the traffic is but imperfectly developed, and consequently that a large increase of profit may be calculated on. In corroboration of which it may be remarked that since the date of the last returns,

the Brighton line has commenced an extension to the sea coast, and the Essendon line has opened up a new traffic, that of carrying live stock.

66. With reference to the construction of the following tables it is to be observed that as some of the lines have not been in operation for a year and some of the quantities given in the returns included a period of two years, it was necessary, in order to afford a means of comparison, to reduce the figures in such returns to one uniform standard of twelve months, the original figures having been used whenever practicable.

TABLE XVIII.—VICTORIA.—RAILWAYS.—SUMMARY OF CAPITAL ACCOUNTS. RECEIPTS.

Name of Railway.	Date opened for Traffic.	Capital. Amount paid up on Shares.	Capital. Loans, Bonds, and Debentures.	Capital. Premium, Interest, &c.	Capital. Revenue, &c., applied as Capital and Liabilities outstanding.	Totals.
		£	£	£	£	£
Melbourne and Hobson's Bay .. .. .. St. Kilda Branch ..	Sep. 13, 1854 May 12, 1857	400,000	100,000	415	—	500,415
St. Kilda and Brighton ..	Dec. 19, 1859	117,960	56,600	—	12,975	187,535
Melbourne and Suburban— Main Line, 1st Section .. Do., 2nd. and final Section Hawthorn Branch, 1st Section .. .. Ditto, 2nd Section ..	 Feb. 8, 1859 Dec. 22, 1860 Sep. 24, 1860 April 13, 1861	258,820	115,300	—	18,912	393,032
Melbourne and Essendon ..	Nov. 1, 1860 ..	54,164	19,359	—	—	73,523
		830,944	291,259	415	31,887	1,154,505
Victorian Railways* .. (*Government Lines*)	Government Debentures for the construction of these Railways by the State, are now in course of issue through the agency of the Six Associated Banks.					
	Amount payable in London ..					7,000,000
	Amount payable in Melbourne ..					1,000,000
						8,000,000

* Of the Government Railways, the state of progress up to 30th September, 1861, is returned thus:—Open to traffic, 90 miles; works in progress, 129 miles. Probable date of completion of the Line between Geelong and Ballaarat, in the first quarter of 1862; and from Woodend to Sandhurst, last quarter of 1862.

TABLE XIX.—VICTORIA.—RAILWAYS.—SUMMARY OF CAPITAL ACCOUNTS—*continued.*

EXPENDITURE.

Name of Railway.	Length of Lines Opened for Traffic.	Cost. Construction.	Cost. Land Compensation and other Expenses.	Cost. Rolling Stock.	Totals.	Cost per Mile. Construction.	Cost per Mile. Land, &c.	Cost per Mile. Rolling Stock.
Melbourne and Hobson's Bay.	m. ch.	£	£	£	£	£	£	£
Main Line	2 40	336,252*	725	55,760	382,737	134,500	290	22,304
St. Kilda Branch..	2 69	96,763	3,456	13,502	113,721	33,804	1,207	4,717
Total of Line	5 29	423,015	4,181	69,262	496,458	78,884	780	12,906
St. Kilda and Brighton.								
Already opened.. The extension will be 1 m. 64 ch., and its cost about £35,000	4 70	156,267	28,727	hired	184,994	32,055	5,893	—
Melbourne and Suburban.								
Melbourne to Chapel Street .... Swan Street to Hawthorn	3 60 / 1 72	215,595	154,113	23,324	393,032	38,159	27,277	4,128
Melbourne and Essendon.								
From Junction with Government Line	4 75	63,461	8,267	hired	71,728	12,853	1,674	—
Totals ..	20 66	858,338	195,288	92,586	1,146,212	41,217	9,378	—
Victorian Railways	90 0	Expenditure to 30th June, 1861, including all payments to that date for construction, land, plant, rolling stock, materials, pier and breakwater at Williamstown, purchase of the Geelong line, &c.			5,503,470			
		Liabilities at same date, including the unexecuted portions of the contracts			2,324,763			
		Total estimated cost of the Government Railways			7,828,233			

* This amount includes the cost, say £80,000, of a pier extending 2,180 feet into Hobson's Bay, the cost of stations, workshops, goods sheds, two bridges over the Yarra, embankments, &c. Moreover, in 1853, when this portion of the line was being constructed, the company paid £2 10s. per day as wages to carpenters and masons, and as high as 17s. 6d. per day for unskilled labor; whilst in 1857, when the St. Kilda branch was constructed, wages had fallen to 15s. per day for carpenters and masons, and 10s. for unskilled labor.

TABLE XX.—VICTORIA.—RAILWAYS.—TRAFFIC AND REVENUE FOR ONE YEAR.

Name of Railway.	Passengers.		Merchandise.		Other Sources of Income.	Total Receipts.	Miles travelled in 12 Months.
	Number.	Amount.	Quantity in Tons.	Amount.			
		£		£	£	£	
Melbourne and Hobson's Bay	1,922,095	48,078	161,614	29,264	3,098	80,440	138,736
St. Kilda and Brighton ..	485,190	10,587	..	..	2,441	13,028	112,752
Melbourne and Suburban	1,682,194	31,585	..	..	1,159	32,744	106,952
Melbourne and Essendon	114,796	4,210	..	..	176	4,386	24,820
Total, Private Lines ..	4,204,275	94,460	161,614	29,264	6,874	130,598	383,260
Victorian Railways, viz.—Melbourne to Williamstown, do. Geelong, do. Sunbury	810,148	83,565	137,836	45,078	11,460	140,103	347,538
Total.. ..	5,014,423	178,025	299,450	74,342	18,334	270,701	730,798

TABLE XXI.—VICTORIA.—RAILWAYS.—PASSENGER RATES OF THE DIFFERENT LINES.

Name of Railway.	Rate per Mile.			
	1st Class.	2nd Class.	1st Class Return.	2nd Class Return.
	d.	d.	d.	d.
Melbourne and Hobson's Bay	3·60	2·40	4·80	3·60
Melbourne and St. Kilda Branch ..	3·20	2·40	4·80	4·00
St. Kilda and Brighton	2·46	1·846	3·69	3·08
Melbourne and Suburban	3·20	2·67	4·80	4·00
Melbourne and Essendon	3·79	2·53	5·05	3·79
Victorian Railways.				
Melbourne and Geelong	1·87	1·07	2·80	1·60
Melbourne and Williamstown	1·30	0·97	1·95	1·62
Melbourne and Woodend	3·69	2·77	5·54	4·12

67. In consequence of the want of completeness and uniformity in some of the returns furnished, the expenditure on revenue account cannot be presented in a tabular form. It is stated, apparently on good grounds, that the reduced cost of skilled labor, and the superior degree of efficiency and economy which has been attained in management, will accomplish a considerable saving in the working expenses as compared with past years.

68. It appears from the returns that, with one exception, no railway company has paid a dividend to its shareholders; that exception is the Hobson's Bay Railway Company, which has annually declared dividends. The dividend in 1860 was 10 per cent. on the paid up capital.

Transport of Goods, Merchandise, Etc., on Turnpike Roads.

69. In addition to the goods traffic by railway, a very extensive trade is carried on by forwarding agents and carriers between the inland centres of population and Melbourne. In consequence of the subdivisions of this trade being in about 500 hands, the precise figures cannot be ascertained; but according to an estimate furnished by the chief forwarding agents, the total number of horses employed in the carrying trade is 4,700, and the number of wagons 1,100. The present value of the horses is about £160,000, and that of the wagons about £54,000.

70. Lines of coaches have been established on all the principal roads of the colony, and the passenger traffic thereby is very extensive.

PUBLIC REVENUE AND EXPENDITURE.

71. The year 1851 was the era of two important events in the history of Victoria: the first being its separation from New South Wales and erection into an independent colony, and the second being the discovery of its auriferous wealth. The total revenue of that year was less than half a million sterling (£486,331 3s. 3d.); but small as this sum appears, it was more than sufficient for the Governmental requirements of the colony, as the expenditure amounted only to £397,993 14s., showing a surplus on the year of nearly ninety thousand pounds (£88,337 9s. 3d.)

72. After ten years' experience of the benefits of separate government, and the full development of the Victorian Gold Fields, the revenue has increased nearly seven-fold, and the expenditure upwards of eight-fold; the former, in 1860, amounting to £3,066,220 15s. 6d., and the latter to £3,228,468 2s. 1d., there being a slight deficit upon the year, amounting to £162,247 6s. 7d.

73. The following tables show the headings of the various items of Revenue, and the expenditure under each department of the Public Service during the year 1860 :—

TABLE XXII.—VICTORIA.—REVENUE, 1860.

Sources of Revenue.	Receipts. £	s.	d.
Customs	1,494,543	14	7
Duty on Victorian spirits	3,510	5	10
Gold...	72,158	0	1
Ports and Harbors	20,656	2	5
Lands	667,628	4	8
Licenses	359,701	8	9
Postage	106,142	15	8
Fees	64,223	14	11
Fines and forfeitures	10,378	8	0
Miscellaneous	267,278	0	7
Total	£3,066,220	15	6

TABLE XXIII.—VICTORIA.—EXPENDITURE, 1860.

Departments.	Expenditure. £	s.	d.
Chief Secretary	717,926	8	5
Attorney-General	160,459	18	9
Treasurer	416,133	18	7
Commissioner of Crown Lands and Survey	619,765	6	11
Commissioner of Public Works	568,137	8	2
Commissioner of Trade and Customs	110,822	4	10
Postmaster-General	161,374	10	8
Special appropriations	473,848	5	9
Total	£3,228,468	2	1

74. The mean number of inhabitants during 1851, was 86,825, which shows the revenue of that year to have been equal to £5 12s. per head, and the expenditure equal to £4 11s. 8d. per head. In 1860 the mean population was 539,337, or an increase since 1851 of upwards of six-fold, the revenue being in the proportion of £5 13s. 8d., and the expenditure in the proportion of £5 19s. 9d. to each man, woman, and child in the colony.

75. In reference to the nature of the public expenditure of this country, it should be borne in mind that it cannot fairly be measured with that of most other countries, until a distinction is made between what may be termed ordinary and extraordinary expenditure. For example: in the Report of the Commissioners

appointed to inquire into the state of the Civil Service of Victoria, the expenditure was divided into two heads, the first embracing such functions as in all countries it is considered the duty of Governments to undertake, such as the administration of justice, the prevention and punishment of crime, the collection and management of the public revenue, and the internal postal communication of the country; and the second including many points which, from the very nature of things, older States are exempted. This will be best understood from the following extract from the Report of the Civil Service Commissioners:—

"It is a necessary incident of the imperfect stage of political development that pertains to a very young country, that the Government is obliged to undertake many functions from which, at a more advanced period of the country's growth, it is relieved. In addition to the ordinary duties of government, the Government of this country is compelled to conduct the business of a great landowner—to survey, to lease, and to sell its property, its town lots, its country lands its pastures, and its mines; to construct and maintain roads and bridges, and other works of public utility; to form railways and electric telegraphs; to assist municipalities, road boards, mining boards and charitable institutions; to establish and supervise lighthouses, lunatic asylums, pounds and cemeteries, and to do many other acts which, in older countries possessing similar institutions, are effected either through private enterprise or through local exertion. Such undertakings may be, indeed, in our present circumstances unavoidable, but they form the principal part of the public expenditure, and their cost, like that of every extraordinary business conducted by Government, is necessarily greater than it will be when the progress of the country admits of these functions being discharged by more suitable organs."

76. In the same report a very careful analysis of the various items of expenditure was gone into for the year 1859, and the conclusion come to was, that the total expenditure of that year, amounting to £3,583,598, consisted of—ordinary expenditure amounting to £1,188,801, and of extraordinary expenditure amounting to £2,394,797: the latter thus being, in round numbers, three times as great as the former, or, more accurately, in the proportion of 100 to 33·17. Dividing the expenditure for 1860 in the same proportions, the extraordinary expenditure of that year would appear to have been £2,157,585 5s. 4d., and the ordinary expenditure £1,070,882 16s. 9d., which latter amount would have necessitated the raising of a revenue of £1 19s. 9d. only per head, instead of £5 19s. 9d., which was necessary to cover both the ordinary and extraordinary expenditure of the year.

Tariff.

77. The following table gives an abstract of the Tariff of Victoria, the quantities of dutiable articles which passed through the Customs, the duties paid upon each article, and the total revenue of the Customs from all sources in 1860.

Table XXIV.—Victoria.—Tariff and Customs Revenue, 1860.

Articles.	Tariff of Victoria.	Quantity on which duty was paid.	Amount received.
	per gallon.	gals. 10ths. 32ds.	£ s. d.
Brandy ... imported	10s.	528,527 8 4	264,266 9 8
Gin ... ... "	10s.	360,778 0 14	180,392 11 4
Rum... ... "	10s.	230,491 4 9	115,245 18 0
Whiskey ... "	10s.	155,162 3 21	77,582 19 7
Cordials ... "	10s.	4,125 9 8	2,063 3 6
Perfumed Spirits "	10s.	2,382 6 20	1,191 13 2
Other " "	10s.	34,333 6 13	17,167 2 1
Spirits distilled in the colony	9s. 3d.	7,589 8 0	3,510 5 10
Total, Spirits ...	...	1,323,393 4 25	661,420 3 2
Wine ... imported	2s.	444,552 6 21	44,455 8 4
Beer... ... "	6d.	3,113.777 5 0	77,844 8 9
Cider ... "	6d.	8,766 0 0	219 3 0
Total, Spirits, Wine, Beer and Cider ...	...	4,890,498 6 14	783,939 3 3
	per lb.	lbs. oz.	
Opium ... imported	10s.	29,775 3	14,887 11 11
Tobacco ... "	2s.	1,524,693 6	152,469 6 9
Cigars ... "	3s.	159,721 12	23,958 5 10
Snuff ... "	2s.	2,889 0	288 18 0
	per cwt.	cwt. qrs. lbs.	
Sugar ... "	6s.	383,839 3 3	115,152 14 2
Molasses and Treacle ... "	3s.	6,503 1 27	975 10 10
	per lb.	lbs. oz.	
Tea ... ... "	6d.	5,013,340 8	125,333 10 3
Coffee ... "	2d.	2,278,476 0	18,987 6 0
	per oz.	oz. dwt. gr.	
Gold (export duty) ...	2s. 6d.	2,156,316 10 19	269.540 2 5
Total, Duties ...	...	...	£1,505,532 9 5
Passenger-rates, Tonnage and Pilotage Dues, Storage of Gunpowder, Seizures, &c.	...	...	59,970 16 2
Total	...	...	£1,565,503 5 7

Public Debt.

78. At the commencement of the present year, the state of the public debt was as follows:—

Table XXV.—Victoria.—The Amount Payable Annually, from 1861 to 1884, in Liquidation of the Principal and Interest of the several Loans contracted or guaranteed by the Victorian Government up to the 31st December, 1860.

When payable.	Water Works Loan.		Melbourne, Mount Alexander, and Murray River Railway Loan.		Railway Loan.		Melbourne Corporation Loan, Guaranteed.	Geelong Corporation Loan, Guaranteed.	Total.	When payable.
	Principal.	Interest.	Principal.	Interest.	Principal.	Interest.				
	£	£	£	£	£	£	£	£	£	
1861	50,000	36,480	..	3,405	..	264,000	25,000	10,000	388,885	1861
1862	50,000	33,480	..	3,405	..	264,000	25,000	10,000	385,885	1862
1863	50,000	30,480	..	3,405	..	264,000	25,000	10,000	382,885	1863
1864	50,000	27,480	..	3,405	..	264,000	25,000	10,000	379,885	1864
1865	50,000	24,480	..	3,405	..	264,000	25,000	10,000	376,885	1865
1866	50,000	21,480	..	3,405	..	264,000	25,000	10,000	373,885	1866
1867	70,000	17,880	..	3,405	..	264,000	25,000	10,000	390,285	1867
1868	63,000	13,890	..	3,405	..	264,000	25,000	10,000	379,295	1868
1869	50,000	10,500	..	3,405	..	264,000	25,000	10,000	362,905	1869
1870	50,000	7,500	..	3,405	..	264,000	25,000	10,000	359,905	1870
1871	50,000	4,500	..	3,405	..	264,000	25,000	10,000	356,905	1871
1872	50,000	1,500	..	3,405	..	264,000	25,000	10,000	353,905	1872
1873	..	..	68,100	3,405	..	264,000	25,000	10,000	370,505	1873
1874	..	..	..	..	..	264,000	25,000	10,000	299,000	1874
1875	..	..	..	..	..	264,000	25,000	10,000	299,000	1875
1876	..	..	..	..	..	264,000	..	..	264,000	1876
1877	..	..	..	..	..	264,000	..	..	264,000	1877
1878	..	..	..	..	..	264,000	..	..	264,000	1878
1879	..	..	..	..	..	264,000	..	..	264,000	1879
1880	..	..	..	..	..	264,000	..	..	264,000	1880
1881	..	..	..	..	..	264,000	..	..	264,000	1881
1882	..	..	..	..	..	264,000	..	..	264,000	1882
1883	..	..	..	..	3,587,500	264,000	..	..	3,851,500	1883
1884	..	..	..	..	812,500	264,000	..	..	1,076,500	1884
	633,000	229,650	68,100	44,265	4,400,000	6,336,000	375,000	150,000	12,136,015	

79. The total amount which it is proposed to raise by loan for railway purposes is £8,000,000, of which as per table, £4,400,000 had been taken up at the commencement of 1861. The total amount required to complete the whole loan at the commencement of 1861 was, therefore, £3,600,000, of which £2,600,000 was to be raised in the English money market, and the remaining million to be subscribed in the colony. If the whole be taken up within the year 1861, the interest at 6 per cent., will after that period amount to £480,000 per annum.

80. The Water and Sewerage Commission obtained power to assess and rate the inhabitants for water supply, and it is estimated that the revenue derivable in this manner will be primarily sufficient to pay the interest, and ultimately to repay the principal. The success of the railways is intimately dependent on the increase of the inhabitants of the colony and the development of their industry, through the connection of the capital with the gold fields and seaboard. The Melbourne and Geelong Corporation Loans could easily be wiped out by the sale, if necessary, of the unalienated land in Melbourne and Geelong.

Water Supply to Melbourne and Suburbs.

81. In Melbourne and part of the surrounding districts there is an abundant and constant supply of water at high pressure from the Yan Yean reservoir. This in reality is an artificial lake, and is formed by the construction of an embankment 1053 yards in length and 30 feet in height, which connects two bluffs, between which had been the only outlet for the drainage of a watershed of about 4,600 acres. The lake or reservoir thus formed, covers an area of about 1,300 acres, or somewhat more than two square miles, the greatest depth being 25 feet and the average 18 feet. The cubic contents in round numbers are about 38,000,000 of cubic yards, or 6,422,000,000 gallons. It is 595 feet above the level of Melbourne, and distant about 19 miles from that city. The communication between the reservoir and the line of pipes is effected by a 33-inch iron pipe, which is carried through the embankment at a level of three feet above the bottom. The head of this pipe is fixed in a square tower well, with arrangements for affording access to the valves, and for admitting water into the mains at heights of 3, 10, and 17 feet from the bottom. A second line of 33-inch pipes has been carried through the embankment, affording the means

of doubling the supply to Melbourne whenever occasion may arise.

82. In addition to the watershed of 4,600 acres from which this reservoir is directly supplied, a watercourse and tunnel have been constructed, connecting it with the River Plenty, and this additional supply is availed of whenever the need arises. The gathering grounds of the Plenty are computed to contain an area of about 60 square miles, which, taking the estimated available rainfall of the Plenty Ranges, would, after the fullest allowance for loss by waste, evaporation and all other causes, afford sufficient to fill the reservoir once and a-half annually.

83. The cost of this gigantic work has been about £820,000,* the money for which was raised by Government debentures bearing 6 per cent. interest. The expenditure was entrusted, by an Act of the Legislature, to the Water and Sewerage Commission, already referred to, whose duties and powers are now merged in the Board of Land and Works. The present income from the water supply is considerable (about £60,000), but this will be much increased as the supply is extended through the various suburban districts, it being estimated that future extensions will yield about 70 per cent. per annum on the cost of such extension.

84. The population of Melbourne and the surrounding districts is about 123,000; and it being estimated that the Yan Yean would suffice for the supply of 200,000 persons, at the rate of 100 gallons per head per day, it will be more than sufficient for the wants of the residents for many years to come. The supply to London is at the rate of 20 gallons per head per day; Wolverhampton 11 gallons; Nottingham 40 gallons; Liverpool 11 gallons. The water is delivered in Melbourne, on the constant service principle and at high pressure, and has proved of great value in extinguishing fires. It is also used as a motive power, and has also partially supplanted steam in driving machinery.

Department of Public Works.

85. The following Expenditure has been made by the Department of Public Works in the ten years ending 31st December, 1860, upon the various Works and Buildings specified:—

* This amount includes expenditure in various items, amounting in the whole to £273,000 which the Commissioners considered should not be chargeable against the Yan Yean scheme, viz.:—Temporary supply to Melbourne, £53,000, and cost of Tramway, £150,000; expended on Sewerage, £32,000; besides superfluous plant, land, fire-plugs, service-pipes, &c.

TABLE XXVI.—VICTORIA.—EXPENDITURE UPON PUBLIC WORKS, 1851-1860.

		£	s.	d.
1	Wharves, Jetties, and Harbor Works	510,041	5	0
2	Dredging operations—River Yarra and Geelong Bar	125,457	11	9
3	Patent Slip, Williamstown	60,335	0	0
4	Lighthouses and Lightships	91,193	4	11
5	Military Buildings—Works and Defences ...	154,475	12	3
6	Telegraph Lines and Stations	152,247	15	9
7	Water Reservoirs and removing Sludge at the Gold Fields	88,584	1	1
8	Gaols	328,265	7	2
9	Penal Buildings and Stockades	189,248	14	6
10	Lunatic Asylum, Yarra Bend	104,067	12	6
11	Police Buildings	205,291	11	11
12	Court Houses	165,317	13	5
13	Post Offices	128,617	17	10
14	Custom Houses	75,573	2	0
15	Fences to Buildings and Lands	26,724	7	2
16	Fencing and Improving Parks, Botanic Gardens, and places of recreation, including Buildings...	57,503	18	11
17	Parliament Houses	175,450	9	5
18	Public Offices, Eastern Hill, Melbourne ...	143,917	1	4
19	Other Public Works, Buildings and Offices throughout the colony	609,440	19	9
	Total Expenditure for ten years, ending 31st December, 1860	£3,391,753	6	8

NOTE.—The Expenditure and Contracts in progress for the year 1861, amounted to £149,609 6s, on the 13th September, 1861.

WAGES AND CONSUMPTION.

WAGES.

86. New countries are subject to considerable fluctuations in the rates of remuneration paid for labor, and to this rule Victoria has not been an exception. But it is a remarkable fact, and at first sight contrary to the understood laws of supply and demand, that in those years when immigration has been at the highest, the rates of wages have invariably risen above those of other years, and on cessation of immigration there has followed a corresponding depression. Thus in the years 1852, 1853, and 1854, in which, respectively, the large numbers of 94,664, 92,312, and 83,410 immigrants arrived, the prices of labor were higher than at any other period in the history of the colony. In the four succeeding years, as fewer people arrived, wages declined somewhat, but still continued high until the last two years, when immigration having

fallen to only about 30,000 persons a year, the rates of labor, although still far above those obtaining in older countries, and, perhaps, also higher than those paid in any other British colony, have been lower than at any other period since the discovery of gold. The following table shows the rates paid in 1854, the last of the three years above mentioned, when, if ever, the effect of the large previous immigration should have been felt; in 1857, when immigration had considerably declined; and in 1861, from the latest quoted rates of the present period.

TABLE XXVII.—VICTORIA.—RATES OF LABOR, 1854, 1857, AND 1861.

Description of Labor.	1854.			1857.			1861.		
AGRICULTURAL LABOR.	£	s.	d.	£	s.	d.	£	s.	d.
Farm laborers per week, with rations	1	15	0	1	5	0	0	15	0
Ploughmen do., do.	2	0	0	1	10	0	1	0	0
Reapers per acre, do.	1	5	0	1	0	0	0	15	0
Mowers do. do.	0	15	0	0	8	0	0	6	0
Threshers per bushel, do. ...	0	1	0	0	0	9	0	0	6
PASTORAL LABOR.									
Shepherds per annum, with rations	48	0	0	35	0	0	33	0	0
Stockkeepers do., do.	65	0	0	50	0	0	40	0	0
Hutkeepers do., do.	35	0	0	28	0	0	25	0	0
Generally useful men on stations per week, do.	1	15	0	1	0	0	0	15	0
Shearers per 100 sheep sheared, do.	2	0	0	0	17	6	Shearing not commenced.		
ARTISAN LABOR.									
Masons per day, without rations	1	12	0	0	16	0	0	14	0
Plasterers do., do.	1	10	0	0	15	0	0	12	0
Bricklayers do., do.	1	8	0	0	15	0	0	12	0
Carpenters do., do.	1	8	0	0	14	0	0	11	0
Blacksmiths do., do.	1	10	0	0	14	0	0	10	0
SERVANTS—MALES AND MARRIED COUPLES.									
Married couples, without family, per annum, with rations ...	115	0	0	80	0	0	70	0	0
Married couples, with family, do.	95	0	0	70	0	0	65	0	0
Man Cooks do., do.	100	0	0	80	0	0	60	0	0
Grooms do., do.	85	0	0	55	0	0	50	0	0
Gardeners	90	0	0	60	0	0	55	0	0
SERVANTS—FEMALES.									
Cooks per annum, with rations	50	0	0	40	0	0	40	0	0
Laundresses do., do.	45	0	0	35	0	0	35	0	0
General servants do.	35	0	0	30	0	0	30	0	0
Housemaids do., do.	28	0	0	25	0	0	25	0	0
Nursemaids do., do.	26	0	0	25	0	0	25	0	0
MISCELLANEOUS LABOR.									
General laborers per day, without rations	0	12	6	0	9	0	0	7	0
Stonebreakers per cubic yard, do.	0	10	0	0	6	0	0	3	6

87. The only class whose wages have not fallen to any great extent, has been that of female domestic servants; and it is a significant fact that female immigrants have constantly been brought to our shores under the auspices of Government, whilst other assisted immigration has for several years been all but stopped; and, also, that for the last two years, the net immigration of females has exceeded that of males in the proportion of 140 females to every 100 males in 1859, and in the proportion of 213 females to every 100 males in 1860, without creating any reduction in the rates of female labor.

PRICES AND CONSUMPTION.

88. In respect to the general reduced rate of wages already alluded to, it must not be lost sight of that although at one time the artisan or laborer was receiving in actual money, a far higher emolument than at present, yet the cost of almost every article required for the use of himself and family has declined in even a greater ratio than his own earnings. An attempt has been made in the following table, to show what has been about the actual weekly cost of living to an artisan and his family during the terms for which the rates of wages have been given:—

TABLE XXIX.—VICTORIA.—COST OF LIVING.—ESTIMATE OF THE WEEKLY EXPENDITURE OF THE FAMILY OF AN ARTISAN, CONSISTING OF A MAN, HIS WIFE, AND THREE CHILDREN, IN 1854, 1857, AND IN THE PRESENT YEAR.

Upon the supposition of the following Rates of Consumption, &c.	1854.			1857.			1861.		
	£	s.	d.	£	s.	d.	£	s.	d.
Bread, 28 lbs.	0	12	6	0	6	8¾	0	5	3
Beef or Mutton, 21 lbs. ...	0	15	9	0	12	3	0	6	10
Potatoes, 21 lbs.	0	5	10½	0	2	10½	0	1	0
Flour, 5 lbs.	0	2	2	0	1	2¼	0	1	0
Tea, 1 lb.	0	2	0	0	2	6	0	2	9
Sugar, 6 lbs.	0	3	0	0	2	6	0	2	3
Soap, 3 lbs.	0	1	0	0	1	0	0	0	9
Candles, 2 lbs.	0	1	6	0	1	4	0	1	2
Milk, 7 pints	0	7	0	0	3	6	0	2	4
Butter, 2 lbs....	0	9	0	0	5	6	0	3	0
Firewood, ¼ ton	0	12	6	0	6	0	0	4	0
Water, 1 load	0	10	0	0	5	0	0	2	0
Rent of a cottage	2	0	0	0	10	0	0	6	0
Clothing	0	15	0	0	10	0	0	6	0
School Fees for children's education	0	3	0	0	3	0	0	3	0
Total Weekly Expenditure ...	7	0	3½	3	13	4½	2	7	4

89. The weekly wages of an artisan, if working full time, would, in 1854, at 30s. a day, amount to £9 a week; in 1857, at 15s. a day, they would amount to £4 10s. a week; and at the present time, at 12s. a day, they would amount to £3 12s. a week. Thus in 1854 he would have each week £1 19s. 8d. above his wages; in 1857 he would have 16s. 7½d.; and at the present time £1 4s. 8d. —the latter being a surplus actually in excess of that of the middle period, and in power of purchasing, certainly far above that of the first. Of course it is impossible to say to what extent in the different years deductions should be made for non-employment; but supposing the days lost were on the whole equal, the comparison would remain fair. The climate of Victoria is so far favorable to out-door operations throughout the year, that but little broken time is made in consequence of the weather. Since 1856 the recognized laboring day of Victoria has been limited to eight hours.

Alcoholic Drink.

90. During 1860, 1,323,393 gallons of spirits were imported or manufactured in the colony, and 218,263 gallons were exported during the year, leaving a residue of 1,105,130 gallons, or an average of 2·05 gallons available for the consumption of each individual of the population. The excess of imports over exports, of wine, beer, and cider, was 3,454,323 gallons, giving, independently of that made in the colony, an average of 6·4 gallons to each individual; or, of spirits, wine, beer, and cider, an average of 8½ gallons to each individual.

91. Comparing these results with those of former years a great decrease in the present consumption of spirituous and fermented liquors is indicated. In 1850, the year prior to the gold discovery, 4·18 gallons of spirits and 6·46 gallons of imported beer, wine, and cider, or a total of 10·64 gallons was the quantity available for the consumption of each individual in the colony; and during 1854, the year when the gold excitement was at its highest, the excess of imports over exports, of spirits, and of beer, wine, and cider, was equal to 6·34 gallons of the former and 12·65 gallons of the latter, making a total of 19 gallons to each individual.

92. It is but right to say, however, that a considerable quantity of illicit distillation is supposed to be at present carried on, which probably, was not the case formerly to so great an extent, and therefore the figures doubtless do not denote the total spirits con-

sumed in 1860. The wine which has been made in the colony is still inconsiderable, but brewing has been an important colonial industry over the whole of the periods, and therefore the figures given do not by any means represent the total quantity of malt liquors available for use during the years cited.

ACCUMULATION.

Savings' Banks.

93. On the 1st July, 1853, there were but four Savings' Banks in Victoria, viz., in Melbourne, Geelong, Portland, and Belfast. In these was deposited at that date the sum of £142,654 15s. 6d., by 2,549 depositors. In 1855 one of these useful institutions was established at Castlemaine; in 1856 two were founded, viz., at Sandhurst and Ballaarat; in 1859 two more, viz., at Maryborough and Warrnambool; and in the present year, one has commenced operations at Kyneton, making a total of ten Savings' Banks now existing in the colony. Their progress from year to year will be found in the following table:—

TABLE XXX.—Victoria.—Savings' Banks.—Number of Depositors, Amount of their Balances, and Average to Each, 1853–1861.

Date.	Number of Depositors.	Total Amount of Depositors' Balances.	Average Balance.
		£ s. d.	£ s. d.
At 1st July, 1853 ...	2,549	142,654 15 6	55 19 3
" 1854 ...	2,761	180,020 5 7	65 4 0
" 1855 ...	2,502	173,090 1 11	69 3 7
" 1856 ...	3,620	245,923 7 10	67 18 8
" 1857 ...	5,682	374,868 9 8	65 19 6
" 1858 ...	7,232	432,250 10 0	59 15 4
" 1859 ...	8,854	468,778 10 11	52 18 11
" 1860 ...	10,135	484,500 19 11	47 16 1
31st March, 1861 ...	11,349	540,622 13 10	47 12 9

94. Of the 11,349 accounts open on the 31st March, 1861, 7,657 were those of male, and 3,692 those of female, depositors.

95. The respective number of Depositors, and total Amounts of Depositors' Balances in the various Savings' Banks on the 31st March, 1861, were as follow:—

TABLE XXXI.—VICTORIA.—DEPOSITORS IN SAVINGS' BANKS, AND AMOUNT OF THEIR BALANCES, 1861.

Place.	Number of Depositors.			Total Amount of Depositors' Balances.
	Males.	Females.	Total.	£ s. d.
Melbourne	4,316	2,265	6,581	341,706 10 11
Geelong	1,175	597	1,772	75,256 14 4
Portland	162	80	242	8,837 19 11
Belfast	55	26	81	2,109 2 7
Castlemaine	414	157	571	21,334 8 3
Sandhurst	831	273	1,104	55,184 5 6
Ballaarat	538	234	772	29,937 9 0
Maryborough	57	18	75	2,325 19 10
Warrnambool	77	33	110	3,317 4 0
Kyneton	32	9	41	612 19 6
Total ...	7,657	3,692	11,349	540,622 13 10

96. The following is a Classification of the Depositors' Balances in all the Savings' Banks in the colony, on the 1st July, 1860:—

TABLE XXXII.—VICTORIA.—SAVINGS' BANKS.—CLASSIFICATION OF DEPOSITS, 1860.

Classification.	Depositors.	Amounts.
		£ s. d.
Not exceeding £20	4,666	32,397 12 6
From £20 to £50	2,555	81,292 12 1
" £50 to £100	1,538	105,680 3 2
" £100 to £150	660	78,526 15 9
" £150 to £200	267	45,769 2 3
Exceeding £200	449	140,834 14 2
Total	10,135	484,500 19 11

FRIENDLY SOCIETIES.

97. Numerous praiseworthy efforts have been from time to time made under the provisions of the Friendly Societies' Act, with a view to the establishment of institutions, for the relief of members during sickness, for the payment of sums at death, and for annuities in old age. The existing Societies consist chiefly of the Lodges of Odd Fellows, and the Courts of Ancient Foresters. A disposition has been shown to place these clubs under the protection of the law, and to follow professional advice not only

in the calculation of the premiums and benefits, but also in the necessary laying out of accumulating funds at compound interest. As population increases, and the habits of the people become more settled, it is hoped that prosperous Friendly Societies will form a striking feature in the social economics of the industrial orders of Victoria. Seeing that the laws of sickness, mortality, and the duration of life have now been reduced to the requirements of exact science, it remains but for the practical common sense of the masses to use them, under professional guidance, in such wise, as to avoid much, if not all, of the lamentable consequences hitherto entailed upon the great bulk of mankind in the old world, by periods of illness unprovided for, premature death, and indigent old age.

Banks and Banking.

98. A full and faithful history of Banking in Victoria would throw a flood of light on many interesting points of political and social economy; and the notes on "Banks and Banking" here given will, few as they are, be of some service towards a future statistical history to be written hereafter.

99. The following is a List of the Banks carrying on business in Victoria:—

Table XXXIII.—Victoria.—Banks, Number of Branches, Etc., 1861.

Name of Bank.	No. of Branches within the Colony.	Head Office, where situate.	Remarks.
The following have no local Proprietary:—			
1. Bank of Australasia ...	10	London	
2. Union Bank of Australia	10	London	
3. Bank of New South Wales	10	Sydney	Has also 4 Agencies for the purchase of Gold
4. London Chartered Bank of Australia	10	London	
5. English, Scottish, and Australian Chartered Bank	3	London	
6. Oriental Bank Corporation	15	London	
The following are local Banks:—			
7. Bank of Victoria ...	15	Melbourne	Including Head Office
8. Colonial Bank of Australasia	7	Melbourne	Including Head Office
9. National Bank of Australasia	10	Melbourne	Including Head Office and Agencies

TABLE XXXIV.—Victoria.—Aggregate Liabilities of the various Banks

	1851.	1853.	1855.	1857.	1858.	1859.	1861.
	£	£	£	£	£	£	£
Notes in Circulation	102,414	1,735,651	1,942,862	2,341,010	1,993,275	1,932,554	1,760,992
Bills ditto	9,240	90,803	49,208	80,111	53,447	65,652	87,757
Deposits	703,167	5,718,486	4,611,567	6,049,626	5,672,247	6,394,258	7,264,111
Due to the Public by the Banks	814,821	7,544,940	6,603,637	8,470,747	7,718,969	8,392,464	9,092,860
Balances due to other Banks	4,480	966,657	313,295	781,066	219,335	269,299	106,697
Totals as per Quarterly Returns	819,301	8,511,597	6,916,932	9,251,813	7,938,304	8,661,763	9,199,557

Note.—The chief portion of the circulation is in notes of One Pound each.

TABLE XXXV.—Victoria.—Aggregate Assets of the various Banks.

	1851.	1853.	1855.	1857.	1858.	1859.	1861.
	£	£	£	£	£	£	£
Coined Gold, Silver, &c.	273,184	3,594,579	2,519,584	2,001,128	2,129,844	1,815,819	2,262,887
Gold, &c., in Bullion and Bars	..	1,391,264	602,666	667,866	492,226	480,923	559,746
Government Securities	..	50,000	511,927	363,850	185,281	31,163	54,507
Landed Property*	18,279	42,594	192,980	280,156	389,570	436,815	497,282
	291,463	5,078,437	3,827,157	3,312,999	3,196,921	2,764,720	3,374,422
All debts due to the Bank by the Public, including Bills under Discount, Overdrawn Accounts, &c.	615,312	2,766,653	4,679,514	8,194,860	7,999,244	9,388,594	9,286,328
Assets	906,775	7,845,090	8,506,671	11,507,859	11,196,165	12,153,314	12,660,750
Notes, and Bills of other Banks	2,034	197,970	111,674	154,050	145,351	151,194	144,396
Balances due from other Banks	..	211,492	661,623	884,598	245,278	283,900	93,185
Totals of Quarterly Returns	908,809	8,254,552	9,279,968	12,546,507	11,586,794	12,588,408	12,898,331

* The "Landed Property" is almost exclusively property possessed within the colony by the several Banks for the purpose of carrying on their business, the Banks being generally precluded by their Act or Patent of Incorporation from advancing money on the security of real property.

100. The general movement of Banking operations in Victoria is given in a condensed form in the preceding tables of assets and liabilities. They have been constructed from the various sworn returns furnished quarterly by the several Banks to the Government, and include the first returns made for the colony of Victoria after its separation from New South Wales on the 1st of July, 1851. The effect of the gold discoveries on colonial Banking operations may be estimated by the difference between the figures for 1851 and 1853.

NOTE CIRCULATION.

101. In order to obtain the net circulation, the amounts opposite to "Notes in Circulation," as shown in Table XXXIV., should be reduced by the amounts of the "Notes of other Banks," which appear amongst the assets, because such notes, being held merely for the purpose of surrender to the respective Banks of Issue, are as effectually retired from circulation as if they had been so surrendered. In regard to "Balances due to other Banks" and "Balances due from other Banks," although the quarterly returns profess to represent the assets and liabilities within the colony of Victoria only, it has been the practice to include under these headings the balances due to and from other banks and branches without the colony, which disturbs to some extent the general effect of the returns as an index to the banking accommodation afforded to colonists; but it is manifest, that if such balances without the colony had not been introduced, the total of the balances due to, and due from, the banks between themselves must be equal; consequently, in estimating the indebtedness of the banks to the colony or the contrary, these lines of information should be disregarded.

102. Applying these observations to the above tables, we arrive at the results of "Indebtedness of and to the Public" as shown in the following table. The value of these results is, however, interfered with by the fact that in the quarterly returns, from which they are deduced, no distinction is made between Government balances and those of private individuals; still, as the ordinary operations on the Government account would not produce any marked fluctuations—and as the exceptional expenditure of Government has been for railways (which in England would be the work of private enterprise), they may in their general effect be

taken as indicating the relation between the banking facilities of the colony and the development of its industry.

TABLE XXXVI.—VICTORIA.—INDEBTEDNESS OF THE PUBLIC TO THE BANKS CONTRASTED WITH THE AMOUNT OF LIABILITIES DUE BY THE BANKS TO THE PUBLIC.

	1851.	1853.	1855.	1857.	1858.	1859.	1861.
	£	£	£	£	£	£	£
Due by the Banks to the Public (as Circulation, Deposits, &c.)	811,787	7,346,970	6,492,964	8,316,697	7,573,618	8,141,270	8,848,464
Indebtedness of the Public to the Banks (as Bills under Discount, &c.)	615,312	2,766,653	4,679,514	8,194,860	7,999,244	9,388,594	9,286,328
Plus Balances	196,475	4,580,317	1,813,450	121,837	—	—	—
Minus Balances	—	—	—	—	425,626	1,247,324	437,864

103. It will be seen by the line "Plus Balances" that from 1851 to 1857, both inclusive, the banks had not lent in this colony any of their own capital, but simply a portion of the deposits and circulation, leaving unemployed in their hands, over the four years, sums varying from £121,837 to £4,580,317; whereas from 1858 to 1861, both inclusive, as appears by the line "Minus Balances," the banks had lent to the colonists the whole of the deposits and circulation, and, in addition, sums varying from £425,626 to £1,247,324.

104. The banks, with one exception, did not allow interest on deposits until the year 1855. On the 30th September in that year the—

		£
Amount of deposit declared as bearing interest, was	...	156,200
In 1857 it had reached	... ...	1,057,262
" 1858 "	... ...	4,421,435
" 1859 "	... ...	4,933,940
" 1861 "	... ...	4,592,581

These sums form, of course, part of the gross amount of deposits appearing in Table XXXIV.

105. No attempt is here made to show the aggregate capital and reserve funds of the first six banks named in Table XXXIII., or the profits which they have divided; because the amounts given under these particular heads in the quarterly returns apply not only to Victoria, but to the other Australian colonies, the Mauritius, India, China, and London.

106 The amounts of capital paid up, and of reserve funds in the three local banks on the 30th June, 1861, stood thus:—

	Paid-up Capital.		Reserve Fund.
Bank of Victoria ...	... £500,000	...	£85,000
Colonial Bank of Australasia ...	312,500	...	50,000
National Bank of Australasia ...	229,261*	...	9,000
	£1,041,761	...	£144,000

107. The circulation of gold coin is considerable, but the real amount has not been ascertained.

108. The coinage of the Sydney mint has been made a legal tender within this colony, displacing (as a natural consequence) the Imperial coinage, which has gradually found its way to India, China, and England. A negociation is in progress with the Imperial Government for the establishment of a mint at Melbourne, notwithstanding that the privilege of an Imperial circulation has hitherto been refused.

Gold Mining Associations.

109. It is now little more than two years since mining on a large scale by public companies was undertaken in Victoria. Previous to that period, gold mining was entirely conducted by parties of working miners on the co-operative system. Great success generally attended their labors, and this was an inducement for the investment in mining operations of a small portion of the surplus capital of the country, a great deal of which was lying unemployed in the banks, bearing a very small rate of interest. When a party of miners got down to the water's level their efforts were paralysed, and it became a necessity to obtain powerful pumping machinery, to enable them to follow the gold-bearing *leads* to a greater depth. This required capital. The claims were valued at a certain amount (generally much too high), and the public were invited to combine for the purpose of erecting pumping and improved crushing machinery for reducing the ore. Occasional success engendered a speculative spirit, which was taken advantage of for the purpose of bringing upon the market many worthless claims, and great public loss ensued. At a moderate calculation the capital of companies which have become defunct during the last two years was half-a-million sterling. Although lost to the original proprietors, this money has not been

* This includes the amount paid up in South Australia, retained and employed there.

wholly lost to the country. The expenditure in wages benefited the mining community, and fostered the manufacturing and trading interests to a considerable extent, and in several instances, after the failure and abandonment of its property by the shareholders, a fresh proprietary became possessed of the mine and plant at a moderate price, and achieved signal success. In the official list of the Melbourne Stock Exchange there are quoted about twenty companies paying dividends with tolerable regularity. The subscribed capital of these companies amounts to £345,000, and the paid-up capital to £300,000. One of these has a capital of £62,000, two of about £40,000, and the rest are under £20,000 each, the lowest being £1,500. The Clunes Company has paid in four years £196 in dividends on each £15 paid-up share (equal to £326 per cent. per annum); the Hercules Company has paid in twelve months £172 on £230 paid-up; the Ajax 57½ per cent. on its paid-up capital, in three months; the Catherine Reef Company 9s. 3d. on 11s. per share paid, in less than a year; and the Vaughan Company 37½ per cent. in about six months. No dividend has been paid at a less rate than five per cent. Of mining companies, which although gold-yielding are not yet dividend-paying there are thirty-seven recognized in the Stock Exchange list. They represent £880,000 subscribed, and £720,000 paid-up capital. Many of these are, through bad management, in a most precarious condition, and will probably be wound up, and the works paid for by the present shareholders will benefit future proprietors. The system of management is but imperfectly understood, and money which should be available for dividend is constantly frittered away in costly official staff and ill-judged works. The wages system has been found unsuitable, and strong efforts are now being made to initiate the tribute system, or in other words, for the working miner to assume his fair quota of risk. Under this latter system the associated shareholders find the costly machinery and plant, and fair and previously agreed upon proportions of the gold are awarded to the capitalist for his investment, and to the miners for their labor. As a whole, mining by public companies, judged by the actual results in gold, would necessarily be pronounced a failure, but the shortness of the period renders it unfair to judge the matter solely by this standard, as much wholesome experience has been gained, and the way for future success has been securely paved.

INTELLECTUAL, MORAL, AND RELIGIOUS PROGRESS.

Education.

110. By the number of persons able to sign their names to the Marriage Register-sheets in each year, it is evident that the adult population of Victoria possesses a higher degree of literary instruction than is enjoyed by that of Great Britain; and it is therefore not surprising that both the colonial legislature and colonial families should have made for years past, earnest and well-directed efforts to secure to the rising generation the blessings of a good education.

University.

111. The University of Melbourne has been open six years, and its degrees are reckoned as equal to those of the English Universities. A recent report by Sir Redmond Barry, its Chancellor, affirms that, "In addition to the training for the degrees in Arts, upon a scale of compulsory instruction more comprehensive than that in many other universities, Schools have been opened for conferring degrees in Law, and for teaching the useful arts of Architecture, Civil Engineering and Surveying. The number of matriculated students is 36, of those attending lectures in law 53, and of those attending lectures in civil engineering and surveying 15, giving a total number of 104, of whom ninety on the whole attend the various lectures with a regularity and attention from which good expectations of their ultimate success may be reasonably entertained." The National Museum of Natural History, and Manufactures and Mining, attached to the University under Professor McCoy, is a source of much popular instruction. It was visited in the year 1860 by 35,204 persons.

Schools.

112. There are several Collegiate and Grammar Schools connected with the larger denominations, such as the Church of England, the Roman Catholic, and the Presbyterian. Primary and secondary instruction is for the most part given under the Denominational and National School Boards. In the year 1851, the total number of schools in the colony was ascertained to amount to 129, and the number of scholars to 7,060. At the commencement of 1861 the schools were found to have increased to 886, and the number of scholars to 51,668. The aid received

from Government and the extent of school fees and other contributions, together with the number of schools and scholars under the three divisions of Denominational, National and Private Schools, are given in the following table:—

TABLE XXXVII.—VICTORIA.—SUMMARY OF SCHOOLS, 1860.

Description of Schools.	Number of Schools.	Number of Scholars.			Aid from Government.			School Fees and Building Contributions.			Total.		
		Boys.	Girls.	Total.	£	s.	d.	£	s.	d.	£	s.	d.
Denominational..	505	18,441	16,162	34,603	84,604	18	5	48,653	10	7	133,258	9	0
National	160	6,726	5,358	12,084	25,550	7	10	12,798	14	5	38,349	2	3
Private	221	1,938	3,043	4,981	—			—			—		
Total ..	886	27,105	24,563	51,668	110,155	6	3	61,452	5	0	171,607	11	3

113. It is believed that there are few of the Victorian children who do not acquire some degree of scholastic instruction, and very vigorous efforts are being made by the various denominations and others, to secure a system at once just, free, comprehensive, and economical, that shall ensure a good intellectual, moral, and religious education, to every child in the community capable of receiving instruction. All the religious denominations have Sunday Schools.

ADULT EDUCATION.

114. For Adults night schools have been established in various parts of the colony. In addition may be mentioned the institutions intended for the already well instructed, such as the Royal Society, the Mechanics' Institute and other societies to the number of nearly fifty, in Melbourne and its suburbs alone. Further, there is the Melbourne Public Library, which was opened on the 11th February, 1856. The following table will show the progress of this admirable institution:—

TABLE XXXVIII. — VICTORIA. — MELBOURNE PUBLIC LIBRARY. — THE NUMBER OF BOOKS AND VISITORS FROM 1856 TO 1861.

Year.	Number of Books.	Visitors.	Open Daily from
			A.M. P.M.
1856	3,846	23,769	10 to 4
1857	5,806	49,226	10 „ 4 and 6 to 9 P.M.
1858	7,320	77,925	10 „ 9
1859	13,214	127,887	10 „ 10
1860	22,024	162,115	10 „ 10
1861	29,120	103,549 (8 months.)	10 „ 10

115. The number of books at present amounts to 29,120, which

were purchased at a cost of £25,000. The size of the building is 145 feet long, 50 feet wide, and 50 feet high, and its total cost £36,000.

116. In connection with the Melbourne Public Library there is a Museum of Art, respecting which the following particulars will prove interesting:—

TABLE XXXIX.—VICTORIA.—MELBOURNE MUSEUM OF ART, OPENED ON THE 24TH MAY, 1861, BY HIS EXCELLENCY THE GOVERNOR OF VICTORIA.

Date.	Number of Visitors.	Open from 12 to 4 P.M. daily.
June	4,778	13,357
July	4,002	
August	4,577	

117. The Museum of Art contains the following:—

1. Library of Books connected with Art and Architecture.
2. Collection of Antique and Modern Sculpture.
3. Collection of Works of Art from the South Kensington Museum—
   Collection A.—Electrotypes of Arms and Vases.
   Collection B.—Fictile Ivories (Diptychs and Tuptychs, from the earliest Christian times).
4. Collection of Photographs from the London Architectural Photograph Society; and of Photographs by the best artists of Europe.
5. The Works published by the Arundel Society—(Books, Engravings, Photographs).
6. Statuettes of Venus and Cupid, in Porcelain, being an Art Union Prize, presented to the Museum of Art.
7. Collection of Casts of the Seals of the Sovereigns of Great Britain.
8. Collection of Casts of the Conventual and Corporate Seals of England.
9. Collection of Casts of Seals.
10. Collection of Metals and Coins.
11. Collection of Arms and Implements, Matwork, &c., from the Fiji Islands.
12. Collection of Indian Fire Arms, Swords, Shields, &c.
13. Collection of Arms and Implements used by the natives of Australia.
14. Collection of Spears and Weapons from Savage Island, lat. 19° South Pacific Ocean.

118. In eight of the other principal towns of the colony public Libraries have been founded, and these receive, periodically, duplicate books on loan from the Melbourne Library. It is proposed to extend this boon to several other places as soon as accommodation shall have been provided by the local authorities.

The Press.

119. The extent of publishing in Victoria is a natural consequence of the incessant mental activity of its inhabitants. In Melbourne alone, of newspapers and periodicals, there are three daily, thirty-one weekly, ten fortnightly, ten monthly, one quarterly, and one annually, or nearly fifty in all. Throughout the whole of Victoria the number of periodical publications amounts to nearly one hundred. These, of course, are exclusive of the scientific and other reports made yearly and at other intervals, by the heads of Government departments, to the Legislature.

Public Worship.

120. In the year 1851, the total number of places of Public Worship in Victoria, including temporary structures and private dwellings, was recorded as thirty-nine. The number of persons officiating was forty-one, and the amount of room was estimated to be available for about fifteen thousand people. At the end of 1860, there were recorded 874 places of worship, which number is known to be under rather than over the mark, and the available room was estimated as sufficient for 150,000 persons. The number of clergy of different denominations registered as legal celebrants of marriage in Victoria at the present time, will be seen by the following table:—

Table XL.—Victoria.—Number of Clergy Registered by the Registrar-General under the Marriage Act 22 Victoria No. 70, for the solemnization of Marriage, 1st September, 1861.

Church of England	81
Roman Catholic Church	42
Presbyterian Church	71
Free Presbyterian Synod	8
United Presbyterian Synod	4
Wesleyan Church	42
Congregational Union	33
Baptist Church	22
Primitive Methodist Church	13
United Methodist Free Church	7
Bible Christians	5
Christian Israelites	1
Free Church of England	1
Unitarians	1
Disciples of Christ	1
Independents (unconnected with any distinctive denomination)	4
German Lutheran Church	4
	340

121. This number gives one religious teacher to every 1,589 of the total population.

Benevolent Institutions.

122. Not the least gratifying trait in the features of Victorian progress is the ungrudging public and private benevolence evidenced by the construction and maintenance in so young a country of its numerous Hospitals, Orphanages, and Benevolent Asylums. The following table exhibits the extent of our public charities. The amount of private benefaction, also, is great; but, for the purpose of the statist, it can never be accurately known :—

Table XLI.—Victoria.—Hospitals, Benevolent Asylums, Orphan Asylums, Etc., 1860.

Description.	Number.	Amount of Accommodation.			Relief Afforded.			Daily Average of Relief Afforded.			Government Aid.			Private Contributions, &c.		
		Males.	Females.	Total.	Indoor.	Outdoor.	Total.	Indoor.	Outdoor.	Total.	£	s.	d.	£	s.	d.
Hospitals, including Melbourne Lying-in Hospital......	18	723	224	947	7,260	13,749	21,009	614	1,029	1,643	48,626	0	0	31,122	19	2
Benevolent Asylums	6	518	183	701	1,145	1,002	2,147	436	90	526	22,033	4	8	12,425	11	11
Orphan Asylums ..	4	201	174	375	275	—	275	146	—	146	8,798	8	3	6,111	9	8
Lunatic Asylums ..	1	351	245	596	—	—	—	—	—	—	9,937	0	0	—		
Immigrant-Aid Society	1	240	160	400	1,625	645	2,270	—	—	217	1,500	0	0	4,058	13	5
	30	2,033	986	3,019	10,305	15,396	25,701	—	—	2,532	90,894	12	11	53,718	14	2

Time and space compel me to conclude this brief and imperfect sketch. Large masses of material, further indicative of progress, I am compelled for the present to leave untouched.

W. H. A.

THE

VEGETATION OF THE COLONY,

ESPECIALLY IN REFERENCE TO ITS RESOURCES.

SKETCHED BY

FERD. MUELLER, M.D., PH. D., F.R.S.

NONE of the wide tracts of the Australian Continent exhibit within an area equal to that of the colony of Victoria a physical aspect and a vegetation equally diversified; and perhaps few other parts of this continent are destined for the development of resources so manifold, and an industry so varied, as have begun already to enliven a territory which, until a few decennia since, remained an unknown wilderness.

Our eastern and southern forest ranges enjoy a subtropical serenity of climate, arising not only from the shelter which the high mountain chains of Tasmania afford against the cold antarctic breezes to our opposite coast, but resulting also from a mitigation of the winter temperature, which a mild, aerial, and oceanic current from extensive tropical latitudes exercise on the south-eastern coast tracts.

In most of the southern littoral regions of Victoria, especially in the forest districts, luxuriates a vegetation preponderant in Tasmanian types, thus at once pointing to the coolness and humidity of an almost insular climate.

Majestic alpine chains, stretching chiefly through the north-eastern part of the Victorian territory, blend in their vegetation many endemic plants with such forms of vegetable life as otherwise are restricted to the Tasmanian island.

The desert tracts, separated but by few meridians from regions in which the snow never entirely melts, surround the observer with expressions of the animated and vegetative creation, which often

bear analogy or resemblance to those of the more central depressions of the Australian continent.

Interjacent between these more prominent physical features of this country, mostly lowlands extend, or gentle mountainous tracts, usually well watered and extensively adapted for culture, although often interrupted by heathy drifts, swampy or morassy depressions, and by those hills and valleys on the golden treasures of which the continued rapid development of our industry so materially depends.

The disparity of the physical conditions of each of the main districts, as sketched out on this occasion, renders it necessary to consider, in however rapid a glance, the natural vegetable products and their agronomic and horticultural capabilities distinctly.

Under so genial a climate as that of East Gipps Land, an exuberance of sub-tropical forms of vegetation extends from the south-eastern frontier of the colony to the environs of Lake King.

A stately fan-palm (*Livistonia Australis*) raises its lofty slender stems to a height of 80 feet, assigning there for the noble order which it represents, the most southward extended geographical latitude. Its terminal bud affords the palm-cabbage, whilst the leaves are much sought as material for the manufacture of hats. It is in this district where the Eucalyptus vegetation recedes to a great extent before trees of Indian type with umbrageous dense horizontal foliage. Species of *Acmene*, *Acronychia*, *Ficus*, *Eupomatia*, *Elæocarpus*, *Angophora*, adorn here the forests, many of them valuable for the quality of their timber, which as yet has been but little subjected to the tests of the practical artisan.

The genus Eucalyptus, predominant in almost every part of Australia, is here partially represented by species restricted to the eastern coast-tracts of the continent, including the Bloodwood (*Eucalyptus corymbosa*), the Woolly But (*Eucalyptus Woollsiana*), the spurious Mahogany (*Eucalyptus botryoides*).* Intricate masses of parasites, comprising species of *Cissus*, *Celastrus*, *Stephania*, *Marsdenia*, *Thylophora*, *Smilax*, and *Eustrephus*, overrun often the highest trees of these forests, and a few epiphytal Orchids of the genera *Dendrobium* and *Sarcochilus* form here the scattered outposts of main masses of plants of East Australia. With better access to this part of the country, its great humidity, together

* Reference to the respective qualities of these timbers and other articles yielded by our flora, and sooner or later available for industry and commerce, will be found in the Jurors' Reports.

with much facility for irrigation, will render it adapted for the growth of rice and other culture plants of the sub-tropical zone, rice being cultivated under the same isothermal zone in the northern hemisphere. The cotton plant is also likely to prosper in these districts sufficiently to render its future culture remunerative, whilst the Chinese tea and a superior kind of tobacco will probably be produced in regions climatically so much favored. Ascending the rivers of Eastern Gipps Land, the traveller soon relinquishes the luxuriant vegetation of the warm littoral valleys; trees and shrubs of a hardier constitution gradually appear,—Eucalyptus species forming again on most places the principal timber, amongst which *Eucalyptus coriacea* and *Eucalyptus Gunnii* are most prevalent,—until beyond the elevation of 4000 feet the forest trees, under the influence of a colder temperature, decrease in size, and at heights above 5000 feet cease to exist, unless struggling for existence on a few and sheltered localities, then reduced to a dimunitive sise, whilst at heights approaching to 6000 feet, the inclemency of a long protracted winter season admits no longer of the existence of woody plants on localities where the brief summer developes only dwarf grasses and depressed truly Alpine herbs, many of great beauty.

Still not all parts of our snowy mountains will remain for ever unoccupied. Many delightful valleys and plateaus, often well grassed, will probably ere long become available for pasture ground, truly an Australian Highland. Above the main sources of the rivers the access from valley to valley, and from table-land to table-land, is usually easy, and interrupted but by fordable brooks. Nothing can surpass the delightful effect produced by a glance over the verdant highland valleys in the midst of summer after an ascent from the perhaps parched plains of the lowland through the jungle of the lower ranges to the open lofty heights and the pure light atmosphere of the Australian Alps. Here it is where probably the llama or alpaca will enjoy a climate most congenial to these useful animals. Here the red and fallow deer would browse on a vegetation in many respects similar to that of their native countries; and here, with the animals of the colder zones also, many hardy fruits and other useful plants could be rendered spontaneous. Without the Alps, from whence the melting of the glaciers maintains never-ceasing streamlets, the noblest of the Australian rivers, the Murray, which circumscribes

the northern boundaries of Victoria, would not force its waters through the desert in a navigable channel to the ocean.

The south-western portion of the Australian Alps is half surrounded by deep humid gullies, in which the dense growth of graceful fern trees (*Alsophila Australis* and *Dicksonia Antarctica*) aids in retaining such an amount of humidity as to admit of the vigorous and copious development of the evergreen beech (*Fagus Cunninghamii*), which constitutes there the main forest. In the turf moors there, and in the shady irrigated forest glens, the Vaccinia and other fruits of the cooler regions would prosper; into these the Arctic firs and the pines of high mountain ranges might be transplanted, secure against the bush fires which so readily devastate the lower forests.

The fern tree vegetation is, however, not restricted to these portions of the country. On the contrary, the greater part of the southern ranges, from the Hopkins River to Gipps Land, are graced by this noble form of vegetation, harboring under their perfect shelter and shade an almost uncountable variety of Cryptogamic plants, which indeed are in few parts of Australia so copiously developed as in fern tree gullies, or on the Alpine moors, or along the shady forest rivulets of Victoria.

Amongst the various trees restricted to these parts of our colony, the Sassafras (*Atherosperma moschatum*) is worthy of special attention, its aromatic bark deserving, as a powerful tonic, extensive adoption into medicine. The blackwood tree (*Acacia Melanoxylon*), which furnishes such a beautiful and durable timber, attains in the fern tree gullies its greatest dimensions. The vigor of the vegetation in the recesses of these ranges is demonstrated when we see occasionally the dwarf swamp tea-tree (*Melaleuca squarrosa*) attaining a height of 120 feet. The soil of these ranges is deep and rich from decay of vegetable remnants, and although with difficulty cleared of timber, sustains cultivation for a lengthened period.

The physiognomies of two landscapes cannot be more strikingly different than those of the fern ranges and the desert. In the former, shade, moisture, tender foliage, and equability of climate prevail; in the latter, dryness of atmosphere causes vast ranges of the summer and winter temperature, whilst the harshness and rigidity of shrubs, often remarkable for the vertical position of their leaves, are calculated to resist the influence of great heat in summer.

Yet by no means has bountiful nature rendered these tracts unavailable for our uses and for permanent occupation. By a judicious storage of rainwater the flocks are now supplied with that element, the presence of which alone is sufficient for constant tenancy of these desert tracts, where the various shrubs are more or less intermixed with pasture grass, and where a great variety of salt bushes afford nutritious and wholesome sustenance to herds, and especially to flocks.

Vast spaces of this scrub country are ornamented with varied plants of the utmost gayness, or covered with peculiar species of *Eucalypti.* The Mallee trees, which, under the permanent occupation of the land are likely to disappear, but which are yielding now to the nomadic hunter, by their long horizontal retentive roots the means of obtaining water in an otherwise waterless desert, and which invested at the summer season with the saccharine cup-like coverings of a half-developed psyllidious insect, furnish together with the roots of various plants, the gum of different *Acaciæ* and *Pittosporum acacioides*, the sugary exudations of *Myoporum platycarpum*, the fruits of *Nitraria* and *Santalum acuminatum* (the Quandang) additional means of subsistence to the aboriginal inhabitants of the soil. The pyramidal Sandarac pine (*Callitris verrucosa*) and the weeping *Exocarpus* agreeably interrupt the monotony of the scrub landscape. The fragrant Myall wood, yielded in these parts of our colony by *Acacia homalophylla*, is one of our most valued ornamental timbers. The red-gum tree (*Eucalyptus rostrata*) indicates, as almost everywhere throughout the country, in long scattered lines, the course of creeks here subject to exsiccation. Beyond the ordinary means of pastoral cultivation much might be effected for the improvement of these parts of the country. The distribution of the date, which in some of the arid parts of Egypt, Arabia, and Persia, forms a considerable share of subsistence for the inhabitants could permanently be effected. The Sugar millet, a plant well calculated to resist the drought, and furnishing its luxuriant foliage during the hottest season, could readily and extensively be reared. The Carab tree, on which, although originally introduced from South Europe, many of the South American pasture-tenants are to a certain extent depending as a fodder fruit, could, no doubt, with many perennial economic grasses and herbs, be naturalized. It is beyond the limits of these pages to dwell on the vast capabilities which Victoria,

under a generally most favorable climate and an extensive fertility of the soil, offers for tillage; all the culture plants of Middle and South Europe may be produced in copiousness and with facility; and how far agriculture and horticulture have, in a country comparatively so young, opened the paths to permanent prosperity may be estimated by reference to the able statistic tables furnished on this occasion by the Registrar-General of the colony. Although the cultivation of the vine compared to the growth of cerealia has remained hitherto in arrear, it has, nevertheless, been established by indisputable facts, that Victoria is not surpassed by many countries in the production of superior grapes for wine, which certainly at a future epoch will take its place not only for principal home consumption, but also for commercial export. The growth of the vine in our latitude is one of remarkable celerity, and the yield of many sorts under experienced management most prolific. Perhaps an equally important branch of industry is open for future skill and exertion in the production of silk; copious plantations recently formed of the quickly growing Chinese Mulberry-tree testify that many of our colonists are persuaded of the great importance of encouraging this branch of rural economy.

The timber resources of our colony are almost unbounded, although our forests are devoid of the larger coniferous trees. *Eucalypti*, often of colossal size and of great durability, including vast quantities of the blue-gum tree (*Eucalyptus Globulus*), will yield in future their timber also for foreign markets, whenever the ramifications of the railway system will have brought the forests more widely into contact with the harbors.

One species of Eucalyptus, principally the Stringybark tree (*Eucalyptus obliqua*, or *Eucalyptus fabrorum*) affords in its fissile wood vast material for shingles; this tree, indeed, constituting in very extensive mountain districts the main part of the forests. Hence it is not improbable that its bark, which is readily separable, thick and fibrous, although not tenacious, will not merely continue to supply the roof for the first rustic dwellings of the settlers, but may eventually be drawn into use for the manufacture of a coarse paper, although neither this nor other native products (*Cyperus vaginatus, Stipa crinita, Lepidospermata, Lavatera plebeja*) are likely to yield a paper material comparable to the available maize straw.

The principal tree and shrub vegetation being myrtaceous, it

may be anticipated to what an unlimited extent the volatile oil of these plants could be obtained for technological purposes.

Eucalyptus leaves were for several years employed for the manufacture of gas to light one of our country towns. The Eucalyptus furnishes also the Australian Kino resin in unbounded quantity. The tanners' bark, principally employed in this colony, is yielded by various Acaciæ (*A. mollissima, A. dealbata, A. pycnantha*) and can be gathered in large quantities.

May these brief remarks be sufficient to demonstrate how far the land of our adoption, which already in youthful vigor made so rapid stride towards its development, whether we regard its geographic position, its physical features, its genial climate, or its immense natural resources, is destined for the abode of millions of happy and prosperous people, and for a great and hopeful future.

MINING AND STATISTICS OF GOLD.

BY

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MINING in the colony of Victoria, is confined almost exclusively to the working of, and the extraction of gold from, the auriferous rocks. The extraordinary richness of the Gold Fields, absorbing nearly all the available labor in the country, has to a certain extent prevented the exploration of the deposits of Tin, Antimony, Iron ore, and Coal, which are known to exist; but now that the gold fever has passed its climax, the attention of capitalists is directed to other mineral resources, and if in this paper, they occupy but a limited space, and appear unimportant, there is yet reason to believe that in a short time they will be largely developed, and afford employment to a great number of persons.

GOLD.

Schists, and sandstone rocks, supposed to be the equivalents of the Silurian rocks of Europe, occupy an area of about 25,000 square miles, (16,000,000 acres), and these are almost everywhere intersected by quartz veins of greater or lesser thickness. The total area of the colony is 55,571,840 acres, and if we add to the above estimate a small proportion of the area of country south of the Murray, and in the central part of Gipps Land, where the schist rocks are known to be overlaid by thin tertiaries and alluvium, we may fairly estimate the probable area of the quartz-bearing rocks at one-third of the total extent of the colony.

In the great centres of mining enterprise, the physical appearance of the country varies so much that it would be difficult, in a brief description, to note the prevailing characteristics of it. Where the

schists and sandstone rocks are predominant, and not covered by more recent formations, as at Castlemaine and Sandhurst, they present a system of steep, narrow ridges, running almost at right-angles to higher and more precipitous ranges of hills, which have only a thin covering of soil, except in the valleys. In many places bands of the highly-inclined, indurated sandstones, which have resisted the action of the weather, may be traced quite up to the top of the ranges, and when the hills are denuded of timber, they form a peculiar feature in the landscape. The watercourses run nearly parallel to each other, and are tributary to main streams, which, in consequence of the rapid fall of the conntry, soon attain a low level, and have most often a tortuous course through rather wide valleys. The streams are almost dry in summer, but in winter, after heavy rains, they discharge a great quantity of water. At the sources of the rivers in Western Gipps Land, and at the sources of the Goulburn, north of the dividing range, the hills are lofty and very steep: quite impassable by carriages of any kind; no deep alluvial or diluvial deposits occur anywhere; and, even in dry seasons, the beds of the streams discharge a considerable quantity of water. In some auriferous districts, as at Ballaarat, Daylesford, and on the River Loddon, basaltic rocks have overflowed the tertiaries, and the physical appearance of the country is entirely changed. Well-defined, extinct volcanic craters and cones appear in the vicinity of these overflows, and extensive level tracts occur. The watercourses have been the receptacles of the greater part of the basalt, and the subsequent action of water has again excavated these; and on the one side is seen the escarpment of basalt, and on the other the steep ranges of schist. It is usually between the two formations, and not through the schist, that the water has made itself new channels.

The auriferous rocks throughout their whole extent have been largely denuded, and great masses of granite and other plutonic rocks are exposed in the more elevated regions. As far as observation has extended, it would appear that the quartz veins have rarely penetrated the granite, and there is reason to believe that the gold found in the alluvium has been derived exclnsively from veins intersecting the schist and sandstones. A slight examination of the alluvial deposits of an auriferous tract, presents to the mind, at once, some idea of the enormous amount of degradation to which the older rocks have been subject—not as would be supposed from

the depth and extent of the very recent formations, for the greater portion of the clays and sands resulting from this action have been washed away—but the attention of the observer is fixed on the nature of the soil, which in some places, for a depth of 20 or 30 feet, is found to be intermixed with minute particles of gold. This fact, and a consideration of the nature of auriferous quartz veins, tend to show that an enormous vertical height of schists and sandstone must have been worn down and washed, through the lapse of ages, to allow of the accumulation of so great quantities of gold, in a finely divided state, in the valleys and watercourses. And if other geological evidence were wanting, this accumulation of gold, in itself, would be conclusive as to the action of the denuding force on the older rocks.

Long before the discovery of gold was publicly announced in Victoria, pieces of the metal had been found by shepherds and others, and numerous anecdotes are related by old settlers of credit respecting these early discoveries. In March, 1850, gold is said to have been found at Clunes; on the 10th June, 1851, it was found near Burn Bank, on a tributary of the River Loddon; on the 20th July, at Mount Alexander; on the 8th August, at Buninyong; and on the 8th September, in the same year, at Ballaarat. The conflicting claims of discoverers render it very difficult to fix the dates with any degree of accuracy, and it is certain that gold had been found and recognized as such, long before public attention was directed to the fact of its probable existence in Victoria. Indeed, there is reason to believe that the statements of settlers who returned to Europe in the early days of the colony, left no room for doubt in the minds of scientific men at home, that Victoria was a gold-producing country. Licenses to dig were first issued on the 1st September, 1851, and such great yields were reported, that the colonists very soon left their ordinary occupations for the exciting work of searching for gold. In 1851, the total male population of the colony was only 46,202, and the sudden withdrawal from their usual pursuits of nearly the half of these, produced a change in the social condition of the country, which eye-witnesses describe as the most wonderful revolution which the world probably has ever witnessed. Lawyers forsook the courts, merchants the counting-houses, clerks their desks, and artisans and laborers fled precipitately from houses but half built, and foundations but partly dug. Even clergymen were drawn to

the exciting scene, and not in every case did they confine themselves to their calling. The price of labor increased enormously, provisions of all kinds rose to unprecedented prices, property in Melbourne was seriously depreciated, and it was only after the great and sudden influx of immigrants from Europe and the neighboring colonies, that society regained, in some measure, its normal state.

But little accurate information is obtainable as to the number of miners *actually employed in digging for gold* in the period extending from 1851 to 1858. In the tables hereunto appended, I have put down for those years the estimates of the Gold Commissioners of the total number of persons on the gold fields. These figures, and the deductions therefrom, must, however, be received with some degree of caution. The gold fields at that time were in a very unsettled state. The numbers may be, perhaps, far below the truth (which is highly probable), or they may exceed it, but they are the only approximate statements we have of the population of the gold fields during that period, and as such, they possess a certain value. Dividing the total yield of gold amongst those persons (supposing all of them to have been engaged in its extraction), we find that in 1851 the yearly average per man was at the rate of £120; in 1852, it was £233; in 1853, £189; in 1854, £130; in 1855, it fell to £100; it again rose to £104 in 1856, and since then the yield per man per annum has gradually decreased until 1860, when the rate was £59.* This brief historical account of the earnings of the miner would be of high interest, and of great value, if we could fully rely on the estimates of the population and on the gold returns of later years, and if the condition of the gold fields had remained unchanged. Such is not the case. There is no doubt that many persons are now returned as miners who do not, on the average, employ two hours per diem in actual mining; and, owing to the great social change, and to the establishment of an admirable police force, rendering all the great highways safe at all times for travellers, many thousand ounces of gold are carried through and out of the colony of which we obtain no account whatever. Consequently the average of £59 per man per annum is probably far below the actual sum

* Divided amongst the total number of *Miners* (returned as such in the tables), the earnings would be, for 1859, £72 per man per year; for 1860, £79; and for the first six months of 1861, at the rate of £69. Even these estimates of the earnings are much too low.

earned. In the condition of the mining population alone there has been a marked alteration. In 1851, 1852, and 1853, the great centres of mining industry were covered by calico tents. A few huts made of the bark of the *Eucalyptus* tree were seen here and there, but the great mass of the population were sheltered by calico and canvas only. The Government officers lived in tents, and the banks transacted their business in little canvas houses, in which the bank manager of the present day would scarcely wish to trust his horse. At the present time, we see large inland towns on the sites of these old camps. Beautiful and solid structures of stone and brick have replaced the calico tents, and miles of streets are paved and channelled. Excellent public buildings have been erected for religion, business, and amusement, and at night one sees, by the light of gas, busy marts, where only a few years ago the ground was entirely in the possession of the miner. This change in itself is startling enough, but it involves other questions almost neglected by those who speak of the decreasing yield of our gold fields. In the early days nearly every man was a miner. The storekeeper had a claim; the hotelkeeper worked at least a portion of every day, and the miner himself worked energetically from sunrise to sundown. This he was obliged to do, for if he ceased to mine, he ceased to earn his daily bread. Now, a large part of the population of each gold field is engaged in ministering to the wants of the miner. There is no longer the same excitement, and there is no longer that steady perseverance and restless activity which distinguished the mining population in the old times. If gold-seeking is disappointing, the miner turns to some other pursuit, and numbers of pursuits are open to him. In the vicinity of every large gold field immense tracts of country are fenced in and cultivated, and thus agriculture, horticulture, and trade are continually absorbing the labor which at one time was confined exclusively to the searching for gold. A comparison of the tables of machinery used by the miners in the several years, from the commencement of the gold-workings, tells only imperfectly the change which has come over the gold fields. If the fact that, in 1856 the value of the whole of the machinery was less than £200,000, and that it is now £1,235,277, speaks of progression, how much more does the actual improvements of those large inland towns bespeak our rapid advancement. While at one time the whole of the buildings of a town might be

reckoned in hundreds of pounds, it must now be reckoned in millions, for millions have been expended in building houses and stores, in forming streets and roads, and the like improvements, in such places as Ballaarat, Castlemaine, and Sandhurst.

In estimating the yields of gold per man, it must not be forgotten that averages give but a very imperfect and incorrect idea of the nature of the pursuit. Many gold miners receive enormous returns for their labor, and others so small profits, that during the greater part of the year they are forced to resort to other pursuits; and yet those are still put down in the tables as miners. If we could separate and ascertain the numbers of those who make fortunes, those who make large profits, and those who find in gold mining only a bare subsistence, the result would be curious indeed. Were it not for the prospect of some day finding a rich deposit of gold, there is no doubt that many who now engage in it, would at once forsake gold mining.

The system of working the auriferous rock, and extracting the gold therefrom, is determined in some respects, by the mode in which the metal occurs. Quartz *reefs* of a width varying from a few inches to more than fifty feet, are found intersecting the older slates and sandstone, and those in many districts are highly auriferous. The strike of the *reefs* or veins is generally a few degrees east or west of north, and the dip varies from 15 to 90 degrees. The quartz veins follow very closely the *strike* of the primary rocks; and at Rushworth and Waranga, where the direction of the rocks is a few degrees north or south of east, the veins runs east and west. These older rocks, with the mineral veins which they contain, as has been already stated, have been subject to extensive denudation. A considerable vertical height has been ground down through the lapse of ages, and again deposited in beds of greater or lesser thickness in the adjacent valleys. Modern changes, such as take place daily, owing to the action of the weather, are continually tending to the deposit of auriferous sands and clays in the beds of the *gullies* and small watercourses; but such are insufficient to explain the extraordinary action which has excavated deep channels in the primitive rocks, and in some places almost entirely carried away and re-deposited the auriferous tertiaries. In the gullies and creeks, where very recent accumulations of sands, gravels, and clays occur, the gold is found in crevices and cavities on the surfaces of the slate rocks,

and is interspersed throughout nearly the whole extent of the deposits in minute scales, small grains, and nuggets.

Necessarily arising out of this condition of things, we have deposits of gold at varying depths and of different ages; and perhaps, for the purposes of this brief description and necessarily imperfect account of mining operations, it may be only necessary to make the following divisions of mining operations:—

1. *Surfacing.*—The washing of the thin covering of earth resting on the tops and sides of the hills, in the close neighborhood of auriferous quartz veins.
2. *Shallow sinking.*—The obtaining *wash-dirt* from off the surface of the old slates and sandstones, by sinking pits or making other excavations in the valleys and creeks.
3. *Sluicing.*—The washing of auriferous earths by streams of water, in the gullies and valleys where thin deposits of sand and gravel occur.
4. *Deep sinking.*—The obtaining the auriferous earths by penetrating the deeper tertiaries.
5. *Tunnelling.*—The obtaining auriferous earths from the deeper deposits by adits.
6. *Quartz mining.*—The obtaining gold from the veins intersecting the primitive rocks.

Surfacing and Shallow Sinking.

In the early days of gold seeking, the miner contented himself with washing the soil found on the sides and tops of the hills intersected by auriferous quartz veins, and digging shallow pits in the clays and gravels found in the beds and gullies of the creeks. The modes of extracting the gold were nearly alike in each case. In surfacing, if the earth was light and sandy, he passed it through a cradle.* The cradle was continually rocked to and fro by the workman, who at the same time poured water on the earth to be washed. A considerable quantity of auriferous drift could be passed through this machine in a day by an industrious man, and when the ground was rich, his earnings were considerable. At the close of his operations, or as often as curiosity led him to investigate the value of the earth he was washing, he carefully removed the sand, clay, and gold from the lower ledges of the cradle, which was re-washed in a shallow tin dish, in the nearest pool of water. If

* A small box, shaped like a cradle, having a perforated sheet of iron at the upper end, and wooden shelves and ledges below. The earth is first put on the perforated plate, which prevents the larger pieces of quartz falling on to the shelves below.

the earth was mixed with tenacious clay it was unfit for the cradle, and it was necessary to *puddle* it, which operation was performed in a large tub. The auriferous earth was thrown into the tub, with a sufficient quantity of water and continually stirred with a spade, until the clay became softened and mixed with the water, which was from time to time poured off and fresh water added. This operation was continued until the gravel and sand became sufficiently free from clay to be fit for the cradle. The gravel and sand thrown away by the miner who worked on this system contained a large per centage of gold, and much of the refuse has since been re-washed with profit.

The small pits dug in the valleys and creeks were carried down to the slate rock where the greater part of the gold was lodged, and small drifts were carried in every direction from the bottom of the pit. These were very insufficiently supported by timber, and soon after the works were abandoned the ground sank. The areas allotted to the miners in the early days were very small, generally about 16 feet by 8 feet for each man.

This kind of mining is still pursued extensively all over the country, and the inefficiency of the means at the command of the miner to extract the gold is evident from the fact that, on nearly all the principal gold fields the alluvium is being worked and re-worked from time to time. Scarcely any of the old flats are entirely forsaken, and with a plentiful supply of water nearly all the old worked ground would yield a profit if re-washed. On the older gold fields, horse puddling and steam puddling machines are now used for the better extraction of gold from the shallow alluvial deposits.

Sluicing.

In the eastern part of the Ovens district, in Gipps Land, and in some other parts of the colony, the flats and gullies are shallow, and the gold is obtained from the earth by means of *sluices*. Water is conveyed great distances in *races* and wooden boxes to the spot where the auriferous earth occurs. In *ground sluicing* a narrow excavation is made in the alluvium down to the bed rock, and the stream of water diverted into this channel at once aids in the work of excavation, and washes the soil, leaving the gold in the hollows and crevices of the rock. From time to time these are cleared out, and the gold freed from adhering clay and

earth by washing in a pan. *Box sluicing* is performed in the following manner :—Narrow boxes of sawn wood inclined at a low angle, from twenty to forty feet in length, the one delivering into the other, are fitted with ledges of wood which act as ripples, and into these boxes the auriferous earth is thrown. The stream of water running through the boxes is mixed with the soil by a workman who rakes the box continually with an iron fork, and the earth is thus washed off, leaving the gold in the ledges formed by the wooden stops or ripples. A perforated iron plate at the end of the upper box separates the coarse gravel from the earth washed down into the lower boxes. At the close of the day's operations the wooden ripples are lifted, and all the gold and fine sand is made to fall into a large bucket, after which the metal is washed off clean in a tin dish. As much as £7, £10, and £20 per week are earned by the industrious miner by this method where the earth is rich and the supply of water sufficient. Many of the races are some miles in length, and in the Ovens district a large capital is invested in works for the conduction of water.

Mr. Mining Surveyor Kennan, speaking of a mining company at Hurdle Flat, in one of the divisions of the Ovens district, says :—

"Their ground is sixteen feet six inches deep, the sluice is in the rock, and in consequence the facility they have of washing the dirt is so great that, I am informed by themselves, that the incredibly small quantity of 4 grs. of gold, or 6d per load, will remunerate them well. There are four partners, and on an average they get down and wash a ton of dirt every five minutes."

In another mining district, at a spot on the Loddon River, the miners remove eleven feet of black soil, and underneath this there are eight feet of gravel and pebbles, the whole of which is washed through sluices. One man can wash seven loads of earth per diem, and the yield is from ½ oz. to 1½ oz. per load. The party averaged £16 per man per week for some time.

At Creswick, in the mining district of Ballaarat, Mr. Mining Surveyor Stevenson states that, at one hill, "the ground washed is from the surface to the bottom, a depth of thirty feet. The mode of working adopted was first to cut a face on the ground, and then to turn on the water along its base. Thus the water assisted in cutting down the ground, and frequently blocks of from twenty to fifty tons were so taken down * * * * * The ground

was poor, yielding less than eight grains to the cubic yard * * * * yet, notwithstanding, the return gave about 11s. per man per day."

Deep Sinking.

Comparatively deep shafts are sunk wherever the older auriferous deposits are found, and where *leads* of gold occur. A *lead* is a depression on the denuded surface of the schist rocks—the course of which, in consequence of its being covered and hidden by the overlaying tertiary or diluvial deposits, is not apparent on the surface of the ground. It is believed by some that if, where the leads occur, the overlying basalt and tertiary rocks were entirely removed from the surface of the primitive rocks, that surface would present a system of watercourses exactly similar in character to that usually seen at the sources of rivers. Other persons suppose that the ancient surface would more resemble that which would be created by the action of a shallow sea or estuary. It is certain, however, that, at Ballaarat, the leads, as far as they have been explored, are not at all dissimilar to ordinary watercourses. The shafts vary in depth from 50 to 500 feet, and a well-conducted mine presents an appearance very similar to an English coalpit. The sides of the shaft are lined and supported by wooden slabs about 8 inches in width, and 2½ inches in thickness, and there are two compartments fitted with slides on which cages run. The shaft is often sunk on speculation, without any knowledge of the actual course of the lead, and it sometimes happens that the exploring drift is driven for a distance of 1,200 feet or 1,500 feet before the *gutter* is reached. When the shaft reaches the schist, the miner is only guided in his search by the trend of the surface, and often great delay and much expense are incurred before the auriferous gravel is found. The working of deep leads is much impeded by the influx of water, and relatively a large proportion of the steam power on the gold fields is employed in pumping water from the deep workings. Altogether there are 311 steam engines of the aggregate of 4,398 horse-power employed in the extraction of gold from the alluvium, that is to say, in pumping, puddling, and washing. The alluvial working at Ballaarat, alone, employ 207 engines of the aggregate of 3,095 horse-power.

Many valuable reports have been received from the mining surveyors on the working of the deep leads. Owing to the small-

ness of the areas of ground granted in former times, compelling the miners to sink a great number of unnecessary shafts, the yield of gold have not, in every case, fully repaid the workmen, but the extreme richness of the deposits is beyond doubt. The period occupied in sinking a shaft ranges from two to five years, and during the whole of that time the miner is dependent solely on his own resources for subsistence. It is only after the *gutter* is reached that he begins to reap the harvest of his labors. In a report made by Mr. Mining Surveyor Davidson, of Ballaarat, it appears that in his division, in which are situate the celebrated leads named the *Golden Point*, *Inkermann*, *Redan*, and *Nightingale*, the average yield of gold is from 10 dwts. to 2½ oz. per cubic yard, and the wash-dirt varies in thickness from one to twelve feet. This fact alone is sufficient to illustrate the value of these deposits. As a further illustration, however, of the results which may be obtained by judicious management, I extract the following statement from a report made by Mr. Mining Surveyor Pringle, of Ballaarat. Respecting the working of the ground claimed by the Round Tower and Red Jacket Companies, Ballaarat, he says :—

"When these companies commenced working, each was registered for a separate lead, shafts were sunk to a depth of about 400 feet, passing through three distinct layers of basalt, which occupied a period of four years. Proper drives were then constructed to discover the position of the auriferous earth or wash-dirt, and after driving in one case 185 feet and in the other 440 feet, a *lead* or *gutter* was broken into. A dispute soon arose as to the ownership of this gutter, and the Court of Mines being appealed to, it created the litigants tenants in common. The gutter was marked out under the order of the Court of Mines, with the following result :—

	£	s.	d.
Wages to working shareholders, at £2 2s. per man per week, in accordance with decree 11th June, 1860	2,411	11	6
Working expenses, including wear and tear of machinery and manager's salary	1,728	17	10
Wages to working shareholders, at £2 8s. per man, per week, in accordance with decree 12th October, 1860	3,969	12	0
Working expenses, including manager's salary ...	2,325	5	11
Interest for use of machinery and plant, at 10 per cent. on £10,000 for eighteen weeks	346	1	0
	£10,781	8	3

Gold obtained, 8,143 ozs. 13 dwt. 23 grs.	£31,971	13	4
Paid as dividends	£21,190	5	1

Respecting the Waterloo Company's Claim, Golden Point Lead, Ballaarat, the mining surveyor states that the total quantity of gold obtained was 6,750 ozs., which at £4 per oz., would amount to £27,000, and the expenses consequent upon carrying through the works were £5,824. The company was occupied two years and one month in working the claim.

The auriferous earth in general is composed of quartz-gravel, sand, and clay, and the gold occurs in small grains, small scales, and rarely in large water-worn pieces, weighing sometimes as much as 3000 oz. The mode of extracting the gold from the earth is simple, and the machinery employed is inexpensive. The puddling machine consists of a wooden box forming the circumference of a circle, within which two harrows are made to move either by a horse travelling round the circle, or by steam power driving a shaft. A sufficient quantity of water is made to flow into the box or channel, and the earth is slowly washed. The box is cleared from time to time, and the resulting rich sand is passed through a *cradle* and the gold finally washed clean in a tin dish. In some districts, as at Sandhurst and other places, where the *wash-dirt* is composed of water-worn quartz pebbles strongly bound together by iron oxide and argillaceous and silicious cements, it is crushed under stampers, and the gold extracted by amalgamation with mercury, exactly as is done with auriferous quartz obtained from veins. The results reported by the mining surveyors show that this system is remunerative.

Leads are found at Ballaarat, Smythesdale, Creswick, Raglan, Ararat, Sandhurst, Indigo, near Beechworth, at Maryborough, &c., &c. They are generally worked only by experienced miners who are well acquainted with mining operations, the modes of timbering shafts and galleries, &c. The price of sinking the shafts differs of course with the nature of the strata to be penetrated and the quantity of water met with. At Ballaarat, where the diluvium is covered with a great thickness of basalt, the cost of sinking is often very high. It is difficult to give an average, but perhaps 30s. to 40s. per vertical foot for a shaft measuring five feet by three feet would be an approximation. Some idea of the nature of the operations may be gained from an examination of the following sections :—

White Horse Lead, Ballaarat.

	Feet.
Surface soil	2
Basalt, clay and soil... ...	10
Basalt	54
Clay	37
Basalt	79
Clay	46
Basalt	45
Black clay	12
Brown clay	16
Drift and gravel	7
Wash-dirt	11
Total depth	319

Kooh-i-noor Company, Golden Point, Ballaarat.

	Feet.
Basalt	111
Light brown clay	10
Gray clay	15
Basalt	70
Brown clay	11
Schist rock *	154
Total depth	371

Inkermann Lead, Ballaarat.

	Feet.
Surface soil	4
Basalt	85
Blue clay	4
Drift	4
Red sandy clay, with water ...	36
Slate reef *	77
Wash-dirt	6
Total depth	216

Indigo Main Lead, Beechworth District.

	Feet.
Red and white clays ...	30
Gravel	30
Red and brown clays ...	40
Red sand and drift... ...	20
Red gravelly clay	5
Gravel	4
Wash-dirt	0½
Total depth	129½

It is impossible in a brief statement such as this is, to give any accurate account of the several strata found on the gold fields. At Ballaarat and at Yandoit, in the Castlemaine district, very interesting deposits of lignite are met with, as well as fossil bones belonging to the *marsupialia*.

Tunnelling.

Where the strata in which the old leads occur have been largely denuded, and where the existing watercourses are at a much lower level than the gutters, adits are made often for a length of 1,700 or 1,800 feet, and the workings are then pursued exactly as if the lead had been penetrated by shafts. At Daylesford much of the ground is worked by tunnels, and the mining surveyor (Mr. Ambrose Johnson) has pointed out the fact that where an old lead has been intersected by a modern watercourse, the newer detrital matter resulting from the breaking up of the old wash-dirt is everywhere rich in gold, exactly as when a watercourse brings down the quartz *detritus* from an auriferous quartz vein.

* Primitive rock, sunk through to attain the level of the gutter.

Nuggets in the Alluvium.

It has been exceedingly difficult to obtain accurate information respecting the large nuggets which have from time to time been found in the alluvial deposits on the gold fields. One nugget was found at Fryer's Creek weighing about 1,000 ozs.,—another, discovered on one of the gold fields, very similar in shape to a leg of mutton, weighed from 700 ozs. to 800 ozs. The "Sarah Sands" nugget weighed 2,700 or 2,800 ozs.;—the "Welcome" nugget weighed about 2,680 ozs.

The following statement kindly prepared by Messrs. W. Clarke and Sons, the gold brokers, gives the weights and other particulars of the more important nuggets which have passed through their hands up to the present time:—

1855, Nov. 10, from Daisy Hill, weighing 525 oz. 18 dwt., containing about 70 oz. of quartz.

1856, Feb. 2,	from	Kingower,	weighing	335 oz. 10 dwt.
	„	„	„	270 oz.
„ May 5,	„	Korong	„	200 oz.
	„	„	„	253 oz. 12 dwt.
„ June	„	Castlemaine	„	154 oz. 9 dwt.
„ Dec. 18,	„	Kingower	„	380 oz. 19 dwt.
	„	„	„	323 oz.

1857, April 29, purchased from J. S. Stevenson from Moliagul, weight before melting, 800 oz.; after, 723 oz. 2 dwt.; assay, 23 carats 27-8.

„ Dec. 18, from Kingower, before melting, 233 oz.; after melting, 226 oz. 5 dwt.; assay, 22 carats 27-8.

„ Sep. 28, from Palmer and McEvoy, from McIvor, before melting, 2,954 oz; after melting, 1,349 oz. 15 dwt.; assay, 23 carats 27-8.

1858, Jan. 14, from Maryborough, before melting, 535 oz. 18 dwt.; assay, 23 carats 27-8; after melting, 464 oz. 11 dwt.

1857, Dec. purchased from Probyn, from Korong, assay, 23 carats $0\frac{3}{8}$; before melting, 204 oz. 5 dwt.; after melting, 191 oz. 6 dwt.

„ „ from Dunolly, before melting, 318 oz. 12 dwt.; assay, 23 carats $0\frac{3}{8}$; after melting, 307 oz. 11 dwt.

1858, Jan. 24, from Maryborough, before melting, 535 oz. 18 dwt.; assay, 23 carats $0\frac{3}{8}$; after melting, 464 oz. 11 dwt.

„ Nov. 10, from Dunolly, before melting, 287 oz. 15 dwt.; assay, 23 carats; after melting, 279 oz. 13 dwt.

Quartz Mining.

It has been already said that the miners in the first instance devoted all their energies to the obtaining the gold from the

alluvium, and it was only after the arrival of experienced miners from Europe that attention was directed to the quartz reefs or veins. These veins were first discovered cropping out in numerous places on the hills forming the watersheds of the auriferous creeks, and they were not unfrequently found forming the bed-rock of the alluvial claims. At first, the particles of gold embedded in the fragments of quartz were regarded with surprise, and so little was known of the modes of occurrence of gold, that pieces of quartz containing only small quantities of gold, and worth only a few shillings, were sold for £10 and £15.

In the early days of the gold fields the miner explored only the surface of the vein or reef, where gold was quite apparent without the aid of the lens. The quartz was broken into fragments and pounded with a hand hammer, and the gold either washed out or amalgamated with mercury, and yet so rich was the matrix that many miners earned thus from £6 to £10 per week. The *tailings* (*i. e.* the refuse pounded quartz) have since been passed through amalgamators with considerable profit, and some machines have been erected for the sole purpose of extracting gold by amalgamation from the tailings left by the miners who first experimented on the quartz veins. It was soon discovered that it was a profitable occupation to pursue the course of the veins of quartz, expensive shafts were sunk to a considerable depth, and at the present time a considerable portion of the total quantity of gold obtained in the colony, probably one-fourth, is yielded by the veins.

Quartz veins are found in nearly every part of the colony where the schist rocks appear at the surface, and the plans furnished by the mining surveyors exhibit them running generally nearly north and south, in close proximity, on all the principal gold fields. The veins vary in thickness from an eighth of an inch to 20 or even 50 feet. If we collect the magnetic bearings of all the known auriferous reefs, we find that the northerly and southerly veins, with rare exceptions, are confined within the lines of oscillation of the magnetic declination, and the easterly and westerly veins are at right-angles to those. That is to say, the easterly and westerly reefs are, with few exceptions, limited to 24 degrees north of west or south of east. Some surprise was excited in the year 1860 by the discovery of gold in the sandstone rocks at Castlemaine. On investigation it was found that the sandstone was intersected by numerous very fine veins of quartz, through which the gold was

distributed; and though in some parts of the rock the quartz had disappeared (probably by slow disintegration), there was nothing in the circumstance to lead to the supposition that the gold had been deposited in the sandstone other than in the usual manner.

In working a quartz vein a shaft is either sunk on the crown of the hill where the vein is found, or the reef is penetrated by an adit; and as the dip of the reef is commonly at a high angle, lateral excavations are made from the shaft or adit at various levels, from which the auriferous rock is excavated. The quartz brought to the surface is broken into pieces, and passed through inclined spouts to the stampers, which resemble the ordinary stamps used in other countries for dressing ores. They weigh about 7 cwt. each, and one stamp strikes about sixty blows per minute. A ten horse-power engine will give motion to eight stamps. The crushed quartz is carried by water over copper ripples, where the gold is brought in contact with mercury. Once a week, or oftener, the ripples are cleared out and the amalgam retorted. Much dissatisfaction is felt by the miner as to the inefficiency of the means used at present to separate the gold from the quartz. When the latter is largely impregnated with iron pyrites and other sulphides the amalgamation is incomplete, and much gold is supposed to be lost. Various experiments have been made, and numerous patents taken out for improved processes—hitherto without much effect on quartz mining; for it is now admitted by experienced miners that the machinery should be erected on a much larger scale, and that the ordinary process would be satisfactory if, instead of small engines of 20, 30, or 40 horse-power, they could employ machinery of 200, 300, or 500 horse-power for crushing purposes.

The mode of extracting the gold from the quartz differs in the details in many respects. Mr. G. W. Hart, the mining surveyor of Sandhurst, says—

"The stamper, in almost every engine, falls from sixty to sixty-five times per minute. The usual weight of the stamp is 5 cwt. The proportion of gold that one pound weight of mercury will take up depends on the size of the particles of gold; that is, after all the superabundant mercury is squeezed out through chamois leather. If the gold be about as coarse as coarse gunpowder, one pound weight of mercury will amalgamate with one pound of gold, but should the gold be finer it will take more mercury; therefore the coarser the grain of the gold the less mercury it takes. The quantity of mercury placed in a machine at one time depends on the construction of

the machinery; generally one hundred and eighty pounds of mercury are required to charge the ripple boxes of a four-stamp engine or battery. It is usual to clear out the boxes, &c., once every fortnight; but most persons clear out the beds under the stamps once every week, as the crushed material, especially when in contact with mercury, becomes so hard through constant pounding of the stamps that a pick is often required to break it up."

Mr. Thomas Lawrence Brown, a mining surveyor of experience in the Castlemaine district, gives the following general description of the mode of extracting gold from quartz:—

"To extract the gold from the hard quartz rock the matrix must be reduced to fine powder, and to effect this the old Cornish stamps continue the most efficient and economical method. The best description of stamps are square or rectangular, cast of the best [?], *i.e.*, hardest white iron, with wrought iron shanks, weighing from 5 to 7 cwt. each. These are placed four together, attached to strong hardwood frames by cast iron guides, and caused to rise and fall sixty to seventy strokes per minute in a cast iron stamp box, weighing 13 cwt., which is fitted with false bottoms cast in four pieces for facility of turning and changing about as they become worn. The cast iron boxes are secured to a solid foundation. The stamps are raised by a cast iron tapped barrel, fitted with wrought iron cams, which act on tongues keyed upon the stamp shanks. The two inner stamps are made to rise first and receive the quartz through a small aperture in the passes, together with a sufficient quantity of water. By the rapid sharp falling of the stamps the quartz becomes pulverized, and is washed by the water through fine iron grates, having forty-five to seventy perforations to the square inch (according to the fineness of the gold) fixed in position in the stamping box, or by *flushets* over which the reduced mineral is forced. Of the numerous appliances that have been patented for separating the gold from the pulverized quartz, the inclined plane with ripples, the shaking table, and the Chilian mill, each containing mercury, are principally used, the object in each being to bring the gold in contact with the mercury and to form an amalgam. These processes continue according to the quantity and richness of the quartz to be reduced, and the gold is then cleaned up by working the table or mill with a regulated flow of water, washing off the quartz and lighter particles of other materials, and the residue with the amalgam and quicksilver is then washed by hand in an enamel dish until the quicksilver is free from foreign particles. After being so washed it is pressed by hand through chamois leather, which retains the amalgam to be retorted. The quantity of gold in the amalgam depends on the quality of the former; if rough coarse gold, the amalgam will only lose one third, if medium-sized gold one half the amalgam will be necessary, and when the gold is very fine nearly two-thirds in weight of amalgam will be lost in retorting. The process of retorting is simple. The amalgam is placed in the cast iron retort, which is carefully jointed and screwed, the retort is then placed on a large fire, and the end of a tube attached to it is placed in a bucket of water. As the retort becomes heated the mercury is volatilized and passes into the water, and the gold remains in the retort in one solid

lump, nearly pure; it is then melted in a crucible, purified from any remaining dross with a little carbonate of soda, or borax, and cast in a mould ready for market."

A table, which I have appended to this paper, shows the results obtained by the quartz miner from a great quantity of quartz rock. It has been compiled with care from the reports furnished by the mining surveyors, and affords a fair estimate of the value of the auriferous veins. From that table it appears that 86,594 tons 16 cwt. have yielded on the average 18 dwt. 22 grs. of gold to the ton. In the report of the Board of Science for the year 1860, it is stated on the authority of Mr. Mining Surveyor Stevenson, that 39,034 tons of quartz, obtained in the Creswick division, produced 1 oz. 4 dwt. 8·41 grs. per ton. These results have been obtained by appliances which are known to be imperfect, and none of the operations have been pursued on a scale which would in Europe be considered large. Very few of the engines exceed 90 horse-power, and the total amount of quartz which they are capable of crushing is inconsiderable. An engine of 18 horse-power, driving sixteen stampers, each weighing about 6 cwt. and giving about sixty blows per minute, will crush about 150 tons of quartz per week; and if we take the average of the machines on the gold fields it may be calculated that one horse-power is required to drive a stamper, and that one stamper will not crush efficiently much more than 9 tons of quartz per week. If all the engines on the gold fields were fully employed, and if we assume that the average yield per ton of quartz was only 15 dwt., they should produce at that rate 49,713 oz. per week, an amount nearly equal to the total produce of gold from all the gold fields.

When the cost of crushing was about £4 per ton, very few of the veins could be worked with profit. Now the cost of crushing and amalgamating is very low indeed—generally less than £1 per ton: and a low yield is found to pay the quartz miner even better than a high yield when the cost of raising and crushing the quartz was so expensive. Even so little as 4 dwt. of gold per ton will remunerate the miner in some localities.

Many of the reefs are of surprising richness. At Castlemaine the mining surveyor has reported yields as high as 266½ ozs. to the ton, and in other cases 101 ozs. to the ton. At Anderson's Creek, not far distant from Melbourne, at Poverty Reef, in Maryborough district, and elsewhere, enormous quantities of gold have been obtained from quartz—and not the surface only but at great

depths. In one shaft at Whroo, gold was found all the way down for a depth of 270 feet—and in many other districts the veins continue to be highly remunerative at depths varying from 100, 200, 300, and even 500 feet, and there is no evidence of any kind to show that they should not be equally rich 1000 or 2000 feet below the surface—but of course the cost of extracting the quartz increases largely with the depth, and therefore a shallow shaft is, other things being equal, much preferable to a deep one.

A quartz-mining adventure requires capital. The sinking of the shaft alone is a work of considerable magnitude. One of the mining surveyors, writing of a small and relatively unimportant division of the Ballaarat mining district says, that a sum of £3000 or £5000 is frequently expended on one shaft, and that the labor, materials, &c., expended on the shafts in his division, have cost not less than half a million sterling. The quartz miner has many difficulties to contend against. From the mode of the occurrence of the reefs (which has already been described) it is found that they collect the water falling on the ranges in large quantities, and, in every district, expensive machinery has to be employed to free the mines from water. In investigating the phenomena on any one reef, it is found that the water level (*i. e.*, the point at which water is reached) sometimes varies remarkably. One shaft may be dry at a depth of 100 feet, and another may be almost unworkable at 80 feet. In other localities, the miners are free from water until a very considerable depth is attained. With all the drawbacks, and surrounded as it is with difficulties, the crushing of quartz is highly remunerative, and from the great extent of our reefs, and their exceeding richness, it is certain that Victoria presents a field for the investment of capital in such enterprises unequalled by any in the world. The fact that our reefs give employment to 18,339 miners, and that these use engines equal to 7,365 horse-power, shows that our small population is not indifferent to the pursuit, but the work that they perform is so slight as compared with the area to be operated on, that hundreds of years would be required, with such means as are now used, even to test adequately all the auriferous reefs which are found in the country.

Tables.

Table No. 4 shows the present state of the gold fields. From that it appears that there are 110,226 persons engaged directly in

the work of extracting gold. Of these 91,887 are employed in alluvial mining, and 18,339 in quartz mining. They use 776 steam engines, equal to 11,763 horse-power; namely, for alluvial mining 311 engines equal to 4,398 horse-power, and for quartz mining 465 engines equal to 7,365 horse-power.

For alluvial mining, in addition to the above, there are 3,256 puddling machines, 412 whims and pulleys, 221 whips, 41 horse-pumps, 181 sluices and toms, 121 water wheels, and 19 hydraulic hoses.

The quartz miners have also 62 crushing machines, worked by some power other than steam (generally horses), 192 whims, 17 water-wheels, 6 derricks, and 15 whips.

The approximate value of the machinery in the colony is £1,235,277; and the total area of the portions of the colony actually mined upon is 561¾ miles.

The value of the machinery per miner is £11 4s. 1½d. On the 31st December, 1859, the approximate value of the machinery for each miner was £8 17s. 5½d., showing that there has been a considerable improvement in the short space of one year and a half. This improvement is in some measure explained by table No. 5, which shows the effect of the leasing regulations under which the capitalists may take up considerable areas of ground for a term not greater than ten years. On the 31st December, 1860, 2,742a. 3r. 28p. had been leased under arrangements to expend a total capital of £1,351,280, and although up to the present time only a small portion of this sum has been expended, it has yet had an influence on the general averages. This system of leasing contrasts strikingly with that on which the miners generally pursue their operations under the miner's right. Dividing the total value of the machinery actually erected amongst all the miners (for the limits of this paper will not admit of a more careful analysis), it appears that the latter have invested about £3 8s. 8½d. per acre in machinery, while the former have proposed to expend, for the same purpose, £206 14s. 0½d. per acre,—and in machinery, labor, tools, inspection, &c., the enormous sum of £492 12s. 6¾d. per acre. It must be borne in mind that the miners under the miner's right do not occupy all the worked auriferous ground—they probably do not use more than one-twelfth—yet still the difference is very great.

Large as is the sum proposed to be invested by the leaseholders, the venture is not so extravagant as might be supposed. The parts

of the country taken up under the leasing regulations, are, of course, selected because of their superior attractions, and let us consider what would be the probable yield of these lands if systematically worked with every regard to efficiency and economy. If we estimate the total area of the ground in the colony which has been exhausted by the ordinary operations of the miner at one-fourth of the total area actually mined upon,—a calculation far from the truth, for in reality very little of the ground has been exhausted, we find that an area of 145½ square miles, or 93,120 acres, has produced, up to the present time, the enormous quantity of £104,649,728 sterling, or an average of nearly £1,123 16s. 4d. per acre.

Management of the Gold Fields.

The whole of the gold fields of the colony are placed under a Mining Department, whose head has a seat in the Legislative Assembly and in the Cabinet. Under the Act of Parliament 21 Vic. No. 32, Wardens are appointed whose duty it is to adjudicate on mining disputes, and there are also higher courts, called Courts of Mines, presided over by a Judge, where appeals are heard and determined. Under the same Act six Mining Boards are created, each consisting of ten members elected by the miners, and, by these, mining bye-laws are made for determining the quantity and form of land which may be occupied for mining purposes, the events on which the title to any claim shall become forfeited; for the drainage of claims, the removal of sludge, &c., &c., &c.

A clause in the same Act gives power to the Governor in Council to lease lands for mining purposes; and regulations respecting those are now in force in all the districts of the colony.

The professional work of surveying and preparing maps of the mines is performed by mining surveyors appointed by His Excellency the Governor in Council. These gentlemen report monthly to the Government on all matters relating to mining in their several divisions, furnish plans, and collect statistics, showing the number of miners actually employed, the number, kind, and power of machines in use, and generally afford professional assistance when required to the Judges of the Courts of Mines, the Wardens, and the Mining Boards. The plans which they furnish are on the scale of four chains to the inch, and they show the situation of all the more important shafts, sites occupied by

machinery, dams, &c. These are reduced and compiled in the Mining Department in Melbourne, lithographed and published at a small price. The necessity for such plans has greatly increased, and the value of them is illustrated by one large plan of the town of Ballaarat west, prepared in 1859, by Mr. Mining Surveyor Davidson, for the Board of Science, by direction of the Honorable John O'Shanassy, then Chief Secretary and head of the Mining Department, which shows that many important buildings in that town had been undermined; and but for this record, happily preserved, the knowledge of the extent of the mining operations, and the position of the workings, would have remained unknown, and probably would in a short time have been forgotten.

The laws relating to the gold fields are at present defective, and the Commissioner of Mines (the Honorable John Basson Humffray) has prepared bills to be submitted to Parliament to provide for the better management of the gold fields, for authorizing and regulating mining on private property, to secure compensation to the families of persons killed by accident, and for the amendment and consolidation of the laws relating to mining partnerships. A bill is also prepared, and will be laid before Parliament by the Honorable the Attorney-General, for the better administration of Justice on the gold fields.

The Legislature, in the year 1860, voted the sum of £30,000 for prospecting for new gold fields, about the half of which was expended under the management of a board, having for its chairman the Honorable Vincent Pyke, at that time Commissioner of Trade and Customs. A gold field of some extent, and in parts, very rich, was discovered by Mr. Alfred Howitt, the leader of an exploring party, on the Crooked River, a tributary of the Wonangaratta, in Gipps Land, and in several parts of the country the miners were enabled to prosecute their search in remote districts, which have since proved auriferous.

As far back as 1855, the attention of the Government was directed to the necessity of supplying the gold fields with water, but it was not until that want was prominently brought under notice by the publication of the Mining Surveyors' reports that steps were taken to construct reservoirs. Meteorological observations show that the rainfall throughout the colony varies from 20 to 30 inches, sufficient in colder countries to keep the watercourses full; but in a dry climate where the evaporation is considerable, and the nature of the rocks not favorable to the retention

of storm-waters, and their reappearance in springs, it is absolutely necessary to construct works of art for the storage of water. In 1860, on the motion of the Honorable Thomas Loader, a sum of £50,000 was voted by the Parliament for that purpose, and twenty-nine reservoirs have been made. The total quantity of water stored is 597,021,583 gallons, at an average cost (exclusive of inspection—not a large item) of £69 2s. per million gallons. The reservoirs, generally, are deep—one of the principal banks is 43·35 feet in height, and the lowest is 8·43. The greatest quantity of water stored in any one reservoir, is 85,811,110 gallons.

Charles John Taylor, Esq., C.E., formerly Resident Engineer at the Yan Yean Reservoir (one of the largest works in the world) is the superintendent for the construction of those works.

So favorable is the contour of the country for the formation of reservoirs, that the Parliament, early in the present year, voted a further sum of £75,000 for new works, and when the advantages of a plentiful supply of good water are experienced on the gold fields, more extensive works will be undertaken. The water will be used mostly for mining purposes.

TABLE No. 1.—Showing the Estimated Populations on the Gold Fields since 1851.

———		Adult Males including Chinese.	Chinese.	Total population of all classes from the Wardens' Returns.	Total adult Miners.*
December,	1851	19,300	...	20,300	
"	1852	33,800	...	44,400	
"	1853	52,800	Not kept separate	75,626	
"	1854	65,763	do.	92,853	
"	1855	109,665	19,244	146,042	
"	1856	115,343	18,109	181,000	
"	1857	132,508	36,327	196,084	
"	1858	147,358	33,673	205,320	
"	1859	139,230	26,044	201,422	125,764
"	1860	144,396	24,886	224,977	108,562
June,	1861	155,149	26,545	240,751	110,226

* Note.—The information in this column is compiled from the Mining Surveyors' reports; all the other portion of the return is made up from the statements furnished from time to time by the Wardens or other Officers in charge of the various districts. The general correctness of the above estimates may be gathered from trifling difference between the estimated population in December, 1856, and the enumerated population, according to the census taken on the 31st March, following. Thus, for the Ballaarat district, the estimate was 49,800, and the enumeration 47,726; for the Castlemaine district, the estimate and enumeration were, respectively, 30,200 and 31,331; for the Sandhurst district, the Wardan's estimate was 32,364, and the census returns showed the population to be 32,417.

TABLE No 2.—Showing the Yield of Gold as indicated by the Quantity brought down by Escort, and the Amount Exported since 1851.

Year.	Per Escort.	Exported.	Value at 80s. per oz.	Average earnings per year, of persons on the gold fields.	Value of yearly earnings at 80s per oz. for each person.	Average earnings per year, for each *miner*.	Value of yearly earnings at 80s. per oz. for each *miner*.
	oz.	oz.	£	oz. dwt.	£	oz. dwt.	£
1851, for 3 months	104,154	145,146	580,584	7 10	30	No distinction made in the returns of population for these periods between miners and others	
1852 " "	2,277,026	1,974,975	7,899,900	58 8	233		
1853 " "	2,065,903	2,497,723	9,990,892	47 6	189		
1854 " "	1,482,697	2,144,699	8,578,796	32 12	130		
1855 " "	2,132,397	2,751,535	11,006,140	25 1	100		
1856 " "	2,625,968	2,999,191	11,996,764	26 0	104		
1857 " "	2,481,020	2,755,956	11,023,824	20 16	83		
1858 " "	2,371,268	2,528,102	10,112,408	17 3	68		
1859 " "	2,202,012	2,280,571	9,122,284	16 7	65	18 2	72
1860 " "	2,008,843	2,156,316	8,625,264	14 18	59	19 17	79
1861, 6 months to 30th June ...	915,743	962,595	3,850,380	6 4	24	8 14	34
	20,667,031	23,196,809	92,787,236				

Note.—In the return of the Gold, per Escort, the quantity forwarded by the Government Escorts to Sydney and Adelaide, and the Private Escorts to Melbourne, during the years 1852, 1853, and 1854, is included. It is not known whether the quantity forwarded by the two first-named Escorts overland is included in the Export column of this return. The amounts were, in 1852, 230,256 ozs.; in 1853, 178,622 oz.; and in 1854, 6,031 ozs. In addition to the Gold exported, named in this return, a considerable quantity is known to have left the colony by private hand, of which no account could be obtained: besides which a large amount must have been used and manufactured for colonial use. The total quantity up to date is estimated at 26,162,432 ozs., of the value of £104,649,728.

TABLE No. 3.—Showing the Increase of Machinery on the Gold Fields since 1855.

Year.	Steam Engines.	Puddling Machines.	Quartz Crushing Machines.	Toms and Sluices.	Horse Machines.	Water Wheels.	Boring Machines.	Whips and Whims.
1855	44	1,521	83	260	...	149	...	...
1856	140	3,526	159	547	30	165	...	370
1857	249	3,657	122	845	...	219	13	459
1858	330	5,241	149	727	72	189	5	283

In 1859 *the Machinery was as follows:—*

285 Steam engines employed in alluvial mining, winding, pumping, &c., of the aggregate horse-power of 3,821.
3,982 Horse puddling machines.
396 Whims.
101 Wheels.
91 Sluices.
77 Toms.
113 Whips.
3 Hand machines.
19 Horse pumps.
8 Water power pumps.
296 Steam engines employed in quartz mining, winding, crushing, &c., of the aggregate horse-power of 4,357½.
7 Water power engines.
69 Whims.
1 Windmill.
4 Horse gear whips.
8 Horse crushing machines.

Total approximate value of all mining plant estimated at £1,155,923.

In 1860 *the Machinery was as follows:—*

294 Steam engines employed in alluvial mining, winding, pumping, &c., of the aggregate horse-power of 4,137¼.
3,958 Horse puddling machines.
354 Whims and pulleys.
138 Water wheels.
623 Sluices and toms.
19 Hydraulic hoses.
134 Whips.
37 Horse pumps.
417 Steam engines employed in quartz mining, winding, crushing, &c., of the aggregate power of 6,645.
41 Water and horse-power crushing machines.
161 Whims.
26 Whips.
1 Horse pump.
5 Water wheels.

Total approximate value of all mining plant estimated at £1,299,303.

TABLE No. 4.—Showing the Number of Miners on the Gold Fields,

District.	Division.	Alluvial Miners.		Quartz Miners.		Mining Population.	Total Population.	Machinery. Steam Engines employed in Winding, Pumping, &c.	
		European.	Chinese.	European.	Chinese.			No.	Aggregate Horse-power.
BALLAARAT.	No. 1	1.086	11	50	..	1.147	10,147	29	724
	No. 2	208	284	510	..	1.002	11,002	3	32
	No. 3	426	1,365	613	52	2.456	15.500	10	95
	No. 4	1,090	220	170	8	1,488	3,288	18	410
	No. 5, or Buninyong	1.000	200	475	..	1,675	2.200	25	364
	No. 6	4,280	850	220	..	5 350	15,000	114	1,400
	Creswick	1,700	1,600	654	..	3,954	7,854	6	56
	Gordon	40	..	55	..	95	495	1	8
	Steiglitz	700	61	350	..	1,111	1.611	1	6
	Blackwood	330	210	221	..	761	1.061	..	..
	Total	10,860	4,801	3,318	60	19,039	68,158	207	3,095
BEECHWORTH.	Spring Creek, &c. ..	1,800	900	150	..	2,850	5,750	17	176
	Yackandandah, &c...	3,480	1,520	95	..	5.095	8,000	1	2
	Indigo	2,899	1,650	120	..	4 669	7.700	20	260
	Buckland	400	1,250	550	..	2.200	2,950	..	..
	" western part	400	..	1,300	..	1,700	2,100	..	..
	Total	8,979	5,320	2,215	..	16,514	26,500	38	438
SANDHURST.	Kangaroo Flat ..	3,578	1,014	1,211	8	5,811	14,724	2	70
	Eaglehawk, &c. ..	3,500	480	1,150	..	5.130	9,130	1	4
	Kilmore	150	..	150	..	300	600	..	..
	Heathcota and Waran a	362	161	1,301	..	2,324	5,875	2	14
	Total	8,090	1,655	3,812	8	13,565	30,829	5	88
MARYBOROUGH.	Maryborough ..	2,200	950	530	..	3,680	7,730	7	118
	Amherst	3.200	400	200	..	3,800	6,600	9	110
	Avoca	7,145	758	1,042	..	8.945	15,000	..	..
	Dunolly	3,170	1,800	750	..	5.720	8.720	2	24
	Inglewood or Korong	4.000	150	3,000	..	7,150	16.150	2	22
	St. Arnaud	5.900	250	600	..	6,750	10,750	..	..
	Total	25,615	4,308	6,122	..	36,045	64,950	20	274
CASTLEMAINE.	Castlemaine	1,720	2,450	700	..	4,870	14,371	..	..
	Fryer's Creek ..	2,200	3,000	180	..	5.380	9,380	8	128
	Hepburn	1,860	787	315	..	2.962	7,712	3	32
	Taradale	400	50	100	..	550	7,550	2	26
	Maldon	920	450	600	..	1,970	6.520	5	80
	St. Andrew's.. ..	1,226	146	69	..	1,441	2,560	2	12
	Total	8,326	6,863	1,964	..	17,173	48,033	20	278
ARARAT.	Ararat	1,550	550	236	..	2,336	5,532	1	12
	Pleasant Creek ..	2 950	280	600	..	3,830	7,600	4	27
	Raglan	978	742	4	..	1.724	4.050	16	186
	Total	5,478	1,572	840	..	7,890	17,182	21	225
	Grand Total ..	67,348	24,539	13,271	68	110,226	255,152	311	4,398

THE KIND AND VALUE OF THE MACHINERY USED, ETC. ETC., JULY, 1861.

Employed in Alluvial Mining.							Mining Machinery employed in Quartz Mining.								Approximate Value of all Mining Plant.	Number of Square Miles actually worked upon.
							Steam Engines employed in Winding, Crushing, &c.									
Puddling Machines.	Whims and Pulleys.	Whips.	Horse Pumps.	Sluices and Toms.	Water Wheels.	Hydraulic Hoses.	No.	Aggregate Horse-power.	Crushing Machines.	Whims.	Horse Pumps.	Water Wheels.	Derricks.	Whips.		
															£	
56	8	..	..	..	..	..	3	83	..	1	..	..	..	..	83,500	1
63	..	..	..	..	..	..	17	300	..	..	..	..	..	..	43,200	1¼
127	82	..	..	..	..	..	30	500	..	10	..	..	..	..	100,000	3¼
55	2	..	..	..	..	..	6	90	..	6	..	..	..	4	43 000	¾
32	45	..	..	..	..	..	11	220	..	..	..	..	..	..	50,000	7
24	10	..	..	..	..	..	10	148	..	1	..	..	..	..	100,000	30
180	62	..	.	..	..	..	26	575	..	19	..	..	..	..	90,000	6½
6	1	..	..	..	..	..	4	51	..	6	..	..	..	..	8,000	1½
5	2	..	..	..	..	..	15	217	..	2	..	..	..	..	16,050	4
6	4	..	..	..	..	..	10	106	..	..	..	9	..	..	22,000	16½
604	216	..	..	..	..	..	132	2,290	..	45	.	9	..	4	505,750	71½
38	15	..	..	..	29	..	1	6	..	..	..	1	..	..	49,000	3
21	2	..	..	..	54	2	1	8	1	..	..	..	..	..	11,000	11¾
108	28	191	..	..	..	..	3	37	..	1	..	..	..	..	33,000	25
..	..	..	..	..	38	17	10	137	..	..	..	5	..	1	29,220	27
..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
167	45	191	..	..	121	19	15	188	1	1	..	7	..	1	122,220	66¾
..	.	..	..	..	..	..	52	853	..	..	..	..	..	..	99,801	4
482	11	..	..	..	..	..	53	758	..	11	..	..	..	..	10,000	4
11	..	..	..	..	..	..	10	120	..	..	..	..	..	..	18,000	12
199	..	..	..	..	..	..	22	294	19	5	..	.	..	..	53,100	37
692	11	..	..	..	..	..	137	2,025	19	16	..	..	..	..	180,901	107
270	14	..	..	..	..	..	11	215	..	24	..	..	..	..	30,600	17
122	28	..	..	..	..	..	8	128	..	..	..	..	..	..	19,350	26½
55	9	..	..	83	..	..	1	14	..	..	..	..	..	..	7,000	21
137	..	..	..	..	..	..	30	333	2	16	..	..	..	..	5,876	8
100	10	..	..	..	..	..	17	219	..	..	..	..	..	..	31,000	27½
56	..	..	..	..	..	..	6	97	..	7	..	..	..	..	17,960	15
740	61	..	..	83	..	..	73	1,006	2	47	..	..	..	..	111,786	115
360	22	..	..	..	..	..	31	568	33	30	..	..	..	..	72,000	25
338	..	30	41	65	..	..	10	185	..	5	..	..	..	10	63 000	12½
127	5	..	..	..	..	..	10	106	4	5	..	..	..	..	22,000	60
11	..	..	..	..	..	..	4	42	1	..	..	..	..	..	7,000	12
84	..	..	..	..	..	..	31	630	..	17	..	..	6	..	80,000	10
13	..	..	..	..	..	..	4	24	1	1	..	1	..	..	7,000	43
933	27	30	41	65	..	..	93	1,555	39	58	..	1	6	10	251,000	162½
45	27	..	..	21	..	..	5	85	..	4	..	..	..	..	6,500	14
20	6	..	..	..	..	..	10	216	1	21	..	..	..	..	41,000	13
55	19	..	..	12	..	..	..	..	..	..	..	..	..	..	16,120	12
120	52	..	..	33	..	..	15	301	1	25	..	..	..	..	63,620	39
3,256	412	221	41	181	121	19	465	7,263	62	192	..	17	6	15	1,235,277	561¾

TABLE No. 5.—Showing the Number of Leases in force on 31st December, 1860; together with the Extent of Ground Leased, the Capital and Value of Machinery proposed to be Employed in Working the said Ground.

Mining District.	Number of Leases.	Alluvial.	Quartz.	Total.	Total Capital proposed.	Value of Machinery proposed to be erected.
		acres r. p.	acres r. p.	acres r. p.	£	£
Ballaarat District	52	580 0 30	714 3 19	1,295 0 9	221,180	83,725
Beechworth District	...	nil.	...	nil.	...	nil.
Sandhurst District	155	...	...	697 0 0	563,050	286,145
Maryborough District	33	...	...	335 1 9	185,800	89,550
Castlemaine District	31	...	...	415 2 10	381,250	107,650
Ararat District	...	nil.	...	nil.	...	nil.
Total	271	...	...	2,742 3 28	1,351,280	567,070

Note.—The distinction between Quartz and Alluvial Leases is, in accordance with the Regulations, only made in the Ballaarat District.

Table No. 6.—Averages: Yield from Quartz, 1860, as extracted from the Mining Surveyors' Reports.

District.	Division.	Tons.		Produce.		Average per Ton.		
		tons.	cwt.	oz.	dwt.	oz.	dwt.	gr.
Ballaarat ...	Number One Division (a)	...		...			...	
	Nnmber Two Division ...	1,909	0	677	15	0	7	2
	Number Three Division	4,379	0	1,426	19	0	6	12
	Number Four Division (b)	433	0	502	2	0	1	3
	Number Five Division ...	2,230	0	1,078	0	0	9	15
	Number Six Division ...	10	0	9	0	0	18	0
	Creswick (c)	50,614	0	32,796	2	0	12	23
	Gordon	1,135	0	754	10	0	13	7
	Steiglitz	98	0	863	18	8	16	7
	Blackwood	267	0	270	0	1	0	5
	Total	61,075	0	38,378	6	0	12	13
Beechworth	Spring Creek, &c. (a) ...	...		...			...	
	Yackandandah, &c. ...	4	8	5	10	1	5	0
	Indigo	480	5	944	8	1	19	8
	Buckland (d)	3,241	3	12,912	8	3	19	16
	Total	3,725	16	13,862	6	3	14	9
Sandhurst	Kangaroo Flat, &c. (e)...	42	0	406	0	9	13	8
	Eaglehawk	23	0	341	0	14	16	12
	Bendigo Flat (f) ...	...		...			...	
	Heathcote (g) ... } Waranga and Whroo }	2,550	15	4,906	0	1	18	11
	Kilmore	63	0	708	8	11	4	21
	Total	2,678	15	6,361	8	2	7	1

(a) None reported.

(b) One company crushed, from 15th August, 1859, to 9th May, 1860, 3,369 tons, which yielded 2,548 oz., or 15 dwt. per ton; another during twelve months to 18th August, 1860, 4,724½ tons, which yielded 2,942½ oz., or 12 dwt. 10 gr. per ton.

(c) This does not include 4,778¼ tons of cement, &c., which produced 1,151 oz. 1 dwt. 5 gr., or 4 dwt. 1 gr. per ton.

(d) Some of this quartz was very rich; one lot of 210 tons yielded 2,729 oz., or 12 oz. 19 dwt. 21 gr. per ton. Part was at the rate of 44¼ oz. per ton.

(e) One of the reefs in this division is reported to have yielded, for several crushings, 92 oz. per ton.

(f) Reports not supplied.

(g) This is exclusive of 1000 tons cement, &c., which yielded 350 oz., or 7 dwt. per ton.

TABLE No. 6.—AVERAGES: YIELD FROM QUARTZ, 1860, AS EXTRACTED FROM THE MINING SURVEYORS' REPORTS—*continued.*

District.	Division.	Tons.	Produce.	Average per Ton.
		tons. cwt.	oz. dwt	oz. dwt. gr.
Maryborough	Maryborough ...	3,943 0	3,482 0	0 17 15
	Amherst (*a*) ...	331 0	298 10	0 18 0
	Avoca and St. Arnaud (*b*)	...	...	...
	Dunolly	50 0	20 0	0 8 0
	Inglewood or Korong (*c*)	224 0	2,544 11	11 7 3
	Total	4,548 0	6,345 1	1 7 21
Castlemaine	Castlemaine (*d*) ...	6,367 0	6,215 2	0 19 12
	Hepburn	101 0	627 8	6 4 5
	Maldon	3,802 5	3,883 18	1 0 10
	St. Andrew's ...	226 0	1,079 0	4 15 11
	Taradale	2,538 10	2,614 3	1 0 14
	Fryer's Creek ...	267 0	536 0	2 0 3
	Total	13,301 15	14,955 11	1 2 11
Ararat ...	Ararat ... Pleasant Creek and Raglan ...	1,265 10	2,002 10	1 11 15
	Total	86,594 16	81,905 2	0 18 22

(*a*) In addition to this, various crushings of stone, principally cement, &c., have been reported, 10,174 tons yielded 9,459 oz., or 18 dwt. 16 gr. per ton.

(*b*) None reported.

(*c*) This is exclusive of 40 tons cement, which yielded 120 oz., or 3 oz. per ton. Of the quartz 22 tons are reported to have yielded 2,300 oz., or 104 oz. 10 dwt. 21 gr. per ton.

(*d*) Two tons of this yielded 207 oz., or 103½ oz. per ton; and 5 tons 346 1-5th oz., or 69 oz. 5 dwt. 4 gr. per ton; and 6 tons 300 oz., or 50 oz. per ton.

TIN.

Tin ore is found in the Ovens district, and in some other parts of the colony. It is found in the beds of the creeks and rivers only, and no veins have yet been opened up. Mr. Mining Surveyor Grimes states, "That Snake's Head Creek (in the Ovens district) is, with the exception of the claim at the junction of the Worragee Creek, being almost entirely worked for black sand (stream tin), which yields from 60 to 80 per cent. of tin. The produce per man per week is from 1 to 2 cwt."

The following statement of Exports has been obtained from the Customs Department :—

Year.	Tin.	Tin Ore.
1853	9 tons and 312 pkgs.	707 tons 11 cwt.
1854	... ...	357 tons 17 cwt.
1855	... ...	109 tons 3 cwt.
1856	1 ton 4 cwt. ...	97 tons 11 cwt.
1857	10 cwt.	60 tons 15 cwt.
1858	1 ton 6 cwt. ...	88 tons 2 cwt. and 160 ingots.
1859	5 cwt.	—
1860	4 tons 18 cwt. ...	59 tons 13 cwt.
1861 (first half of)	2 cwt.	556 tons 1 cwt.

Silver, Antimony, Lead, and Copper.

Antimony is found in veins of considerable thickness at McIvor, as a sulphuret, and extensive operations are now being carried out there for the extraction of the mineral. It occurs in veins with quartz and gold. It is found at Anderson's Creek, Steiglitz, and in the northern parts of the mining district of Maryborough. In many quartz veins, sulphuret of lead (with traces of silver), copper, and antimony, are found; but it is only at McIvor that the working of antimony has engaged the attention of the miners. Silver is found as an alloy with gold at Reedy Creek and elsewhere; and embolite (chloro-bromide of silver) is obtained at St. Arnaud.

Iron.

The ores of iron are found in nearly all parts of the colony, and arrangements are about to be made for the working and reduction of the oxides of iron, which occur in thick veins in the mining districts of Castlemaine and Sandhurst. Masses of native iron, with nickel, are found in the Western Port district.

Clays.

Very valuable clays are found in the colony, suitable for the manufacture of the finer kinds of earthenware, and china clay of excellent quality exists in masses at Bulla, on the Deep Creek, about twelve miles from Melbourne. Licenses have been taken

out for working kaolin, and probably the clay will soon be extensively used.

The clay at Bulla is derived from the decomposition of granite rocks, and it exists *in situ.*

DIAMONDS.

The diamond is said to occur in the Ovens district, and the local newspapers report that thirteen stones have been found near Beechworth. Machinery is about to be erected for washing the gravels where the stones have been found.

TOPAZ, ETC.

The topaz is found in the Ararat district, at Castlemaine, Beechworth, &c. Fine stones, very suitable for optical purposes, have been obtained near Pleasant Creek, a tributary of the River Wimmera. Sapphires, zircons, &c., are found at Castlemaine and other gold fields.

COAL.

The coal-bearing rocks in Victoria occupy an area equal to about 3000 square miles, or 1,920,000 acres. These rocks occur in Gipps Land, in the counties of Mornington, Grant, Bourke, and Polwarth, and in the Portland Bay district. Very few seams of coal have been discovered, and respecting those there is scarcely any information available as to whether or not they can be economically worked. The seams at Cape Patterson vary in thickness from a few inches to 3 feet 9 inches. The Victoria Coal Company have applied to the Government, and received permission to raise 500 tons of coal; and if their adventure be pursued, it will tend to develope that coal field, and show whether or not the working of such coal seams can be profitably pursued at present.

Lignite has been found near Ballaarat, and in other parts of the colony, but it is not worked.

NOTE.—Regulations have recently been made by the Governor in Council, under which, and in accordance with the Act 24 Vic. No. 117, persons may take up, for a term not exceeding thirty years, for mining purposes, areas of ground from a quarter of an acre to six hundred and forty acres, at a rent of two shillings per acre per annum, and the payment of two per centum on the value of the mineral or metal at the mouth of the mine.

CLIMATOLOGICAL OUTLINES

FOR THE

COLONY OF VICTORIA,

BY

GEORGE NEUMAYER,

Director of the Magnetical, Nautical, and Meteorological Observatory of Melbourne.

It is the object of this short sketch to give a clear and comprehensive delineation of our climate, for which purpose it is indispensable to have a knowledge of the topographical features of this colony. As it is supposed, however, that in other branches of scientific research forming part of this general report a topographical description of Victoria has been embodied, and that it was more fully treated than it could possibly come within the province of these lines, mention will be made only of such facts as are requisite for a description of the various Meteorological Stations throughout the colony.

The geographical position of Williamstown, the zeropoint of the system of co-ordinates for the survey of the colony, is, according to the results of the geodetic survey, in Latitude 37° 52′ 42″ South, and in Longitude 9h. 39m. 54s. East of Greenwich.

The Flagstaff Observatory is situated about 4 miles N. 30° E. from this standard point, on an elevation above the level of the sea equal to 120·7 feet, fully exposed to all winds, and distant from any considerable elevation.

The elevations of the other stations throughout the colony, as far as they have been ascertained already, may be be learnt from the following:—

Ararat ...	... 1,072	feet above the level of the sea.
Ballaarat ...	... 1,437	" " "
Beechworth ...	... 1,750	" " "
Castlemaine ...	... 942	" " "
Geelong ...	... 96	" " "
Heathcote ...	... 789	" " "
Mount Warreneep	... 2,450	" " "
Portland ...	... 36	" " "
Port Albert ...	... 7	" " "
Sandhurst ...	... 779	" " "

These stations are situated partly towards the north of the Great Dividing Range, and partly towards the south of it, and some of them near it, as can best be seen by a map of the country.

I 2

After these few preliminary remarks, we proceed with revising the various meteorological elements, with special regard to our colony, and commence with the Temperature of Air.

At the end of the results bearing more especially upon the climate are some facts annexed having reference to terrestrial magnetism and the occurrence of meteors, which will be of great general interest.

The temperature of air in its mean value and ranges, forming such an important element in the climatology of a country, may first be taken into consideration; and before entering upon the distribution of heat throughout the year and over the country, it will be of interest to examine some of the leading features of the results arrived at in Melbourne, as a long and carefully carried out series of observations are here at our command.

The observations which have been carried on from the year 1842 to 1850, give as a mean of the temperature of air for the above period 57·6°. The single years, however, cannot possibly agree with each other so well on account of the methods applied for determining their means.

Commencing with 1842, these values are 58·3°, 58·3°, 56·6°, 59·3°, 57·3°, 58·0°, 56·2°, 56·1°, 58·7°, ending with 1850. From subsequent observations in 1856 and 1857, the mean value of the temperature is 58·5° and 59·7°, and if we include these results in the above series, the mean temperature for eleven years mentioned amounts to 57·87°, which value well agrees with the one derived from hourly observations at the Flagstaff Observatory during the years 1858, 1859, and 1860—namely, 57·79°, 57·81°, and 57·86°, giving a mean temperature for Melbourne of 57·82°. From the degree with which these values tally, we should be led to believe that the oscillations in the above series previous to 1858 are rather due to the methods by which the mean temperatures were obtained, than to the actual oscillations in this value.

From the observations made at the Flagstaff Observatory, the mean temperature and the mean range for the various months of several years is as follows :—

—	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
Mean temperature	68·0	65·2	63·5	58·6	53·6	48·1	47·4	51·4	52·7	57·9	62·0	65·7
Mean monthly range	54·5	56·5	45·0	45·3	35·7	29·1	24·8	30·2	43·1	45·7	56·6	57·0

The mean monthly range in temperature of air therefore amounts to 43·1°.

The lowest temperature, which generally occurs in the month of July, is several tenths of a degree more or less than 32°, and consequently a correct idea of the annual range in temperature of air can be formed by perusing the table of the highest temperatures for the last six years :—

1855, in December	... 98·5°	1858, in November	... 103·2°
1856, in January	... 98·0°	1859, in February	... 104·0°
1857, in January	... 101·0°	1860, in January	... 111·0°

Greatly as varies the time when the highest temperature may be expected, there seems still to be so much certain, that the period between the 21st and 25th of January is characterized by a very high mean temperature (73·6°), while, on the other hand, it must be stated that between December the 27th and 31st, and January the 6th and 10th, maxima in the mean temperature occurred.

In speaking of the extremes of temperature, mention ought to be made that hoar-frost and ice are occasionally observed during the months of June, July, August, and September, and it is a fact worthy of notice, that as late as the 22nd of September hoar-frost was seen at Melbourne; but it chiefly occurs during July, and seldom in June. The lowest temperature generally takes place between the 20th and 24th of July, the five-day means for this time being 44·7°.

Great attention was invariably bestowed upon terrestrial and solar radiation ; the former was observed by the aid of a parabolic reflector, placed in a box with a double bottom, the intermediate space well filled up with wadding; the latter by the aid of Casella's maximum solar radiation thermometer.

As means of the maxima and minima of each month for several years, resulted the following :—

Means of	Jan.	Feb.	Mar.	Apr.	May.	Jun.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Max. solar radiation	109·8°	107·7°	103·0°	95·5°	86·6°	77·8°	79·8°	85·7°	93·2°	98·5°	103·9°	107·5°
Min. terrestr. radiation	55·0	52·4	52·4	47·5	44·1	39·8	36·7	39·6	39·9	45·8	48·4	52·5
Difference	54·8	55·3	50·6	48·0	42·5	38·0	43·1	46·1	53·3	52·7	55·5	55·0

The mean temperature of soil, as indicated by a thermometer

slightly covered with soil, and another buried 14 inches below the surface, is, for the various seasons, derived from two years' observations:—

Seasons.	Surface.	14 inches deep.
Spring	62°·2	59°·1
Summer	72·5	71·3
Autumn	61·3	62·6
Winter	49·0	49·2
Year	61·25	60·55

The mean daily range in temperature of surface soil amounts to 41·1°, for spring; 47·3°, for summer; 28·6°, for autumn; 17·6°, for winter; giving an annual mean value of 33·7°. Before concluding the remarks on temperature having special reference to Melbourne, there are still two points of interest to be mentioned. We refer to the daily curve of the temperature of air, and the thermic wind-rose. But, as it is likely that comparative tables on this subject would occupy too much room, it was thought advisable to subjoin only the mean temperatures for the even hours in each season, and the year. With regard to the thermic wind-rose, we shall only give the mean temperature of the eight cardinal winds of winter and summer.

Mean Temperature of Air for the Even Hours of every Quarter.

Hours.	September, October, November.	December, January, February.	March, April, May.	June, July, August.	Year.
Midnight ...	52°12	60°20	55°35	46°01	53°42
2h. A.M. ...	51·03	58·78	54·30	45·32	52·36
4h. „ ...	50·30	57·72	53·42	44·71	51·54
6h. „ ...	51·17	59·32	53·02	44·29	51·95
8h. „ ...	57·18	65·68	56·31	45·49	56·17
10h. „ ...	62·55	71·69	62·69	50·99	61·98
Noon ...	65·15	74·64	66·03	54·65	65·12
2h. P.M. ...	65·79	75·53	67·13	55·74	66·05
4h. „ ...	63·74	73·84	65·05	53·70	64·08
6h. „ ...	59·46	69·79	60·97	50·02	60·06
8h. „ ...	56·15	64·72	58·36	48·51	56·93
10h. „ ...	54·18	62·35	56·55	47·10	55·04

The mean daily amplitude in the oscillations of temperature of air for the year is equal to 14·83°, and for the various seasons as follow:—In spring, 15·59°; in summer, 18·09°; in autumn,

14·12°; and in winter, 11·51°. The mean daily range is, for the same seasons respectively, 19·1°, 21·2°, 17·4°, 14·5°, giving a mean for the year of 18·05°.

THERMIC WIND-ROSE.

	Winter.	Summer.
S.	49·40° ...	68·93°
S.E.	47·63 ...	61·27
E.	50·10 ...	65·02
N.E.	43·0 ...	68·09
N.	50·37 ...	75·26
N.W.	47·38 ...	62·67
W.	49·09 ...	58·85
S.W.	50·07 ...	63·34

Characteristic are in this respect the very sudden and great changes of air on hot-wind days, at the time of the shifting of the wind towards the south, amounting, in some instances, to 20° or 30° in less than half-an-hour.

The distribution of heat throughout the country will be seen by the subjoined table, giving the means for each quarter and for the year, as also the differences between the hottest and coldest months, and between summer and winter; also the mean monthly range for each station:—

Names of Stations.	Mean Temperature.					Difference in Mean of		Mean Monthly Range.
	Spring.	Summer	Autumn	Winter.	Year.	Hottest and Coldest Month.	Summer and Winter.	
Alberton ...	54·7°	64·5°	58·0°	49·2°	56·8°	20·0°	15·3°	—°
Ararat ...	58·2	70·5	58·4	46·7	58·5	27·2	23·8	—
Ballaarat ...	53·6	63·4	54·4	44·4	54·0	22·8	19·0	45·3
Beechworth ...	57·2	68·9	58·5	44·1	57·2	29·6	24·8	44·1
Camperdown ...	54·0	62·5	55·1	45·9	54·4	18·2	16·6	54·4
Castlemaine ...	56·5	66·8	57·0	45·6	56·5	25·2	21·2	52·9
Echuca ...	60·3	75·9	63·6	50·5	62·6	30·4	25·4	41·2
Mount Egerton	51·5	66·9	53·8	45·3	54·4	25·0	21·6	—
Geelong ...	56·1	64·3	58·1	49·0	56·9	18·0	15·3	44·9
Heathcote ...	57·8	69·3	58 0	45·4	57·6	28·1	23·9	51·1
Melbourne ...	57·5	66·3	58·6	49·0	57·8	20·6	17·3	43·1
Sandhurst ...	59·5	68·7	60·2	45·6	58·5	26·8	23·1	41·0
Swan Hill ...	58·8	77·7	66·3	46·3	62 3	39·3	31·4	—

July is for all stations the coldest month, and ice chiefly occurs during this month; it must, however, be stated that hoar-frost and ice have been observed at the mountainous stations—Ballaarat, Beechworth, Castlemaine, Heathcote, Sandhurst, and

Warreneep—as late as the middle of October, although to this month and to September the fall of snow is more peculiar.

In autumn, ice may be occasionally seen in the hilly country during the last days of March, but more regularly in April; while in those stations near the sea coast it does not appear before the last days in May, or in June, and is never seen after the 25th or 30th of September. The average number of days when hoar-frost and ice occur are 35 for Heathcote, 16 for Ballaarat, 11 for Beechworth, &c.; and the year 1859, which was particularly favorable for the formation of ice, shows seven days on which it occurred in Melbourne.

Comparing the mean temperatures of Victoria with those of other countries we should of course not do so without due regard to the elevations above the level of the sea. Suffice it, however, to point out some striking features of the state of temperature at Melbourne, which it has in common with some places in the south of Portugal; for although Marseilles, Bordeaux, Bologna, Nice, Verona, and Madrid, are on or near the isothermal line corresponding with that of the southern hemisphere passing through Melbourne, the difference between winter and summer, and the hottest and coldest month, are by far less for our country than for the abovenamed localities. With regard to these differences Melbourne closely resembles Lisbon; but the values of the mean temperature for the different seasons are in the latter capital in excess to the corresponding ones here, while they are nearly the same as at Mafra, 700 feet above the sea, only 18 miles to the N.W. of Lisbon, and in lat. 38° 55′ N.

If we reduce the various values from Mafra and Lisbon to those from Melbourne we obtain the following little table of differences:—

—	Mean Temperature.					Difference of Mean Temperature of	
	Spring.	Summer.	Autumn.	Winter.	Year.	Hottest and Coldest Month.	Summer and Winter.
Mafra	+0°36	−0°80	−2°50	+0°59	−0°70	−4°10	−2°98
Lisbon	+3·55	+2·15	+4·50	+7·91	+3·60	+0·10	+0·89
Melbourne ...	0·00	0·00	0·00	0·00	0·00	0·00	0·00

The lower Murray district and the Northern Wimmera appear, from the few and not very reliable observations at command, to partake more of the character of Algiers, and more particularly of Constantine.

It is perhaps here the best place to say a few words about our atmosphere as regards its humidity.

The mean temperature of the dewpoint for each month, as derived from observations taken every third hour at the Flagstaff Observatory with Regnault's hygrometer, are:—

	°		°		°		°
September	43·5	December	51·8	March	50·9	June	43·5
October	46·6	January	54·1	April	47·9	July	40·5
November	48·2	February	53·9	May	44·7	August	42·5
Spring	46·1	Summer	53·3	Autumn	47·8	Winter	42·2

Giving a mean temperature of the dewpoint for the year of 47·3°. For those stations at which the observations have been sufficiently numerous and reliable to admit of a computation of their relative humidity, this has been carried out, and the results stated in the subjoined table:—

Station.	Spring.	Summer.	Autumn.	Winter.	Year.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Ballaarat	69	62	74	82	72
Beechworth ...	68	61	66	77	68
Castlemaine ...	71	63	74	83	73
Geelong	69	70	71	79	72
Heathcote	69	82	69	82	76
Melbourne	71	67	71	81	73
Sandhurst	56	57	71	79	66

The variations to which the relative humidity is subjected are very considerable, which may be judged from the fact that in the summer season it is not uncommon that on the afternoon the relative humidity is reduced to 24 or 25 per cent. In such cases the mean of the day amounted to 58 or 60 per cent., and in hot-wind days for a few hours, with a daily mean of between 30 and 40 per cent., the humidity may even be reduced to 13 or 15 per cent.

Although it would be pertinent to the subject to treat on the hourly variations in pressure of vapor, and on the relation between this element, temperature, and pressure of air, we refrain from entering on these points, as theoretical deductions ought not to come within the scope of these short outlines; and we therefore

direct our attention next to the pressure of air peculiar to this country, and first of all to Melbourne.

The pressure of air is subjected to considerable oscillations in shorter and longer periods. The greatest range observed at Melbourne during three years amounts to 1·728 inches, the extremes occurring on the 19th of December, 1858, during a gale from S.W. and a heavy fall of rain, and on the 2nd of August, 1859, at 10 a.m., when the pressure was respectively 28·872 and 30·560 inches. This latter number was only 0·004 inch more than in the following year, when the pressure of air at the same date and the same hour reached its maximum.

The period between the 30th of July and 6th of August, appears by a perusal of the five-day means, to be of a very high pressure of air, if not, as already mentioned, a maximum. There are other times of the year, in April, May, and October, exhibiting a great tendency towards a maximum in this respect, but by far less decided.

The greatest value the mean pressure for a period of five days reached is 30·420 inches; and the smallest, 29·504 inches, giving a range of 0·916 inches. The minimum of these short periods occurs in the summer season.

From the hourly observations in Melbourne, the mean pressure of air for the single months, and the mean monthly range has been computed, in some instances using the respective months for three and others for four years.

Month.	Mean for Month.	Range for Month.
	Inches.	Inches.
January	29·774	0·690
February	29·824	0·805
March	29·919	0·696
April	29·980	0·908
May	29·931	1·022
June	29·949	0·905
July	30·036	0·795
August	29·970	0·924
September	29·875	0·933
October	29·898	0 964
November	29·854	0·805
December	29·789	0·972

The yearly mean amounts to 29·900 inches, and the mean monthly range for the year to 0·868 inches. We perceive at once how the mean annual curve of atmospheric pressure shows exactly the opposite nature with respect to season and turning points; as

has been shown when speaking of the mean annual curve of temperature, July is the maximum and January the minimum, the difference being 0·212 inches. A secondary maximum takes place in April. The monthly range cannot be expected as yet to exhibit the law of its variation with the same degree of distinctness after so short a period of observation, but we glean from the results that the monthly range is greatest in winter months, least in the summer, while in spring and autumn it approaches to its mean value, though the month of May shows the maximum monthly range, and March partakes in this respect too much of the character of a summer month. The difference of the monthly ranges of January and May is equal to 0·332 inches.

By far more reliable are the results deducible from enquiries, with a view to ascertain the amplitude of the daily curve of pressure of air throughout the seasons. We see at once how it increases towards the summer months (0·071). Assuming a mean value during spring and autumn (0·063), and a minimum in winter (0·037). In the month of January the daily amplitude is greatest, being 0·077 inches, while in the month of July it is only 0·035 inches; the turning points of this curve occur at 9 h. 20 m. a.m., and 3 h. 45 m. p.m.; the latter being the minimum, the former the maximum. A secondary maximum takes place at 9 p.m., and a minimum at 4 a.m. These results are meant for the curve of the year in the different seasons; the time of the turning points does slightly oscillate, as can best be seen by inspection of the subjoined table, which contains the mean pressure of air for the even hours of the day:—

MEAN PRESSURE OF AIR FOR THE EVEN HOURS OF EVERY QUARTER.

Hours.	September, October, November.	December, January, February.	March, April, May.	June, July, August.	Year.
Midnight ...	29·886	29·802	29·947	30·014	29·912
2 h. A.M. ...	29·871	29·784	29·936	30·006	29·899
4 h. „ ...	29·865	29·782	29·929	29·996	29·893
6 h. „ ...	29·884	29·803	29·942	30·006	29·909
8 h. „ ...	29·902	29·818	29·965	30·027	29·928
10 h. „ ...	29·901	29·812	29·967	30·038	29·930
Noon	29·878	29·793	29·942	30·011	29·908
2 h. P.M. ...	29·850	29·769	29·914	29·983	29·879
4 h. „ ...	29·841	29·753	29·907	29·982	29·871
6 h. „ ...	29·858	29·763	29·938	29·999	29·889
8 h. „ ...	29·887	29·796	29·949	30·016	29·912
10 h. „ ...	29·893	29·808	29·958	30·020	29·920

Previous to entering upon a comparison of the phenomena connected with the pressure of air as observed at Melbourne and the other stations throughout the colony, the influence of the various winds upon the barometer must first be sketched; and this cannot be more effectually done than by subjoining the barometric wind-rose, as derived from observations in the years 1858 and 1859.

The mean pressure of air at Melbourne for the respective winds is—

	Inches.		Inches.
S.	29·930	N.	29·821
S.E.	29·954	N.W.	29·840
E.	29·896	W.	29·854
N.E.	29·878	S.W.	29·885

The mean daily range in pressure of air for Melbourne, but 120 feet above, and for Ballaarat, 1,437 feet above the level of the sea, is given in the table below; and it is to be remarked that, in the first instance, the results have been derived from observations during 1858, 1859, and 1860; in the latter, only from observations during 1859 and 1860:—

—	Melbourne.	Ballaarat.
	Inches.	Inches.
Spring	0·191	0·104
Summer	0·163	0·088
Autumn	0·157	0·092
Winter	0·152	0·098
Year	0·166	0·096

The mean daily range is greatest for Melbourne in September, and least in February, from which Ballaarat seems to differ, in so far as there the greatest range occurs in August, the difference for these months being 0·056 and 0·032 inches respectively.

To facilitate the comparison of the variations in the pressure of air throughout the months and seasons at the different stations in the country, a table may conclude the few remarks on this subject, containing the mean pressure and the monthly range for the various seasons. The stations follow in it according to their elevation above the level of the sea, commencing with the lowest, it being understood, as in all foregoing facts, that no correction was applied to the observations for altitude.

Quarter.	Portland.		Geelong.		Melbourne.		Sandhurst.	
	Mean pressure.	Monthly range.	Mean pressure.	Monthly range.	Mean pressure.	Monthly range.	Mean pressure.	Monthly range.
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
Spring ...	29·965	0·837	29·916	0·882	29·875	0·942	29·148	0·816
Summer ...	29·877	0·800	29·850	0·744	29·796	0·842	29·100	0·667
Autumn ...	30·032	0·850	30·003	0·751	29·946	0·838	29·344	0·603
Winter ...	30·073	0·883	30·003	0·796	29·969	0·859	29·237	0·740
Year ...	29·987	0·842	29·943	0·793	29·897	0·870	29·207	0·708

Quarter.	Heathcote.		Castlemaine.		Ballaarat.		Beechworth.	
	Mean pressure.	Monthly range.	Mean pressure.	Monthly range.	Mean pressure.	Monthly range	Mean pressure.	Monthly range.
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
Spring ...	29·194	0·772	28·957	0·783	28·493	0·780	28·110	0·706
Summer ...	29·109	0·700	28·849	0·738	28·438	0·728	28·062	0·761
Autumn ...	29·263	0·760	29·023	0·723	28·571	0·769	28·190	0·841
Winter ...	29·294	0·798	29·048	0·732	28·606	0·755	28·180	0·755
Year ...	29·215	0·758	28·969	0·744	28·527	0·758	28·135	0·766

We proceed now to the examination and description of the winds prevalent and peculiar to our climate.

The main features of the systems of currents of air in the colony of Victoria are delineated by the alternation of the equatorial and polar current, with such modifications as are dictated by the peculiarities of the various localities in which registration of meteorological facts has been carried on. Near the sea, land and sea breezes greatly influence the general character of winds, their relative frequency and succession. As it is a matter of such vast importance, for the thorough understanding of a climate, to have a knowledge of the mean direction of the wind and the law of the changes which take place in the direction of the currents of air, it will not appear superfluous to examine somewhat more closely the leading points in these respects.

The mean direction of the current of air at Melbourne, computed from hourly observations made during the year 1858 to 1859, was found to be N. 44° 57′ W., or as near as possible N.W.; and for the various quarters the mean direction seems to be as follows:—

in spring, S. 80° 20′ W.; summer, S. 17° 44′ W.; autumn, N. 50° 45′ E.; and in winter N. 14° 31′ W.,—showing at once the preponderance of the northerly winds in winter and autumn, and of southerly winds in summer and spring. To illustrate the relative frequency of winds for various points of the compass, the subjoined table will be found useful; and it must be remarked, that the frequency of the east winds is taken as unit:—

Quarters.	S.	S.E.	E.	N.E.	N.	N.W.	W.	S.W.
Spring ...	4·1	1·9	1·0	2·8	3·5	2·6	3·5	2·9
Summer ...	2·5	2·0	1·0	1·4	1·4	0·8	1·6	2·0
Autumn ...	2·7	1·5	1·0	2·7	3·0	1·8	2·6	2·3
Winter ...	2·0	0·8	1·0	6·2	8·4	3·3	4·9	2·6
Year ...	2·8	1·6	1·0	3·3	4·1	2·1	3·2	2·5

We glean from this table by one glance, that there are two distinct minima in frequency: winds from N.W. in summer, and winds from S.E. in winter, which expresses, that in the summer season the equatorial current is but seldom observed, as in the winter season the polar current.

The force of wind is very variable thoroughout the year, and depends to a great extent on the prevailing winds during a certain month or season; but this much may be given as reliable, that the mean force—expressed according to Beaufort's notation—is nearly alike for winter and spring (2·57); whereas for summer and autumn the mean force is 2·43 and 1·73 respectively. With regard to the force of wind from various points of the compass the following table will give a clear idea:—

Quarters.	S.	S.E.	E.	N.E.	N.	N.W.	W.	S.W.
Spring ...	2·3	1·9	1·5	1·9	3·4	2·2	2 4	2·9
Summer ...	2·3	1 5	1·5	1·8	3·5	2·3	2·8	3·0
Autumn ...	2·0	1.3	1·0	1·5	2·2	1 3	1·6	2·8
Winter ...	1·6	1·2	1·0	1·8	3 4	2·1	2·5	3·0

N. and S.W. winds are the most powerful ones, while east winds are but very light in Melbourne, except in spring and summer.

Interesting with regard to the force of wind is the curve of the hourly means for the year, which exhibits its turning points at an interval of exactly twelve hours—the wind being lightest, on an average, at 1 h. a.m., and strongest at 1 h. p.m., showing a regular increase and decrease between these points.

With regard to prevailing winds in other parts of the colony, it appears, as far as observations extend, that the various stations may be arranged in two great classes, namely—those at which winds from south and north prevail; and those at which west and east winds are more frequent. In the first class appear Ararat, Ballaarat, Castlemaine, Geelong, Heathcote, Melbourne, and Sandhurst; in the second, Alberton, Beechworth, Camperdown, and Portland.

The mean relative frequency of wind for the year in both classes seems to be as follows, taking that wind as unit in each case which occurs least frequently:—

	S.	S.E.	E.	N.E.	N.	N.W.	W.	S.W.
I.	3·5	2·5	1·0	1·5	3·0	2·5	2·5	2·6
II.	1·1	1·0	2·2	1·1	1·6	1·8	2·4	2·5

Westerly winds are, throughout the country at all seasons, frequent, and blow generally with great violence and in heavy squalls. All country stations belonging to the first named class partake more or less of the character of Melbourne with regard to prevailing winds in various seasons, as is sufficiently clearly laid down in the table given above. Beechworth, Camperdown, Alberton, and Portland also show, with regard to frequency of winds, the general character of the system of two alternating currents, and the occasional strong winds from the east do not materially affect this general character.

While this is the state of things along the coast and inland, farther out at sea S.E. and S.W. winds prevail in summer, and in the winter season strong winds from N.E. to N.W. blow with frequent and sudden shifts towards S.W. In connection with this latter subject, it is interesting to learn something of the more regular and steady shifts. The law in this respect is clearly expressed by the fact that the regular shifts take place in longer and shorter periods in the sense S., E., N., W., S., and if we call revolutions in this order direct, the number of direct revolutions performed during the various seasons is as follows:—In spring,

11·5; summer, 10·4; autumn, 11·3; winter, 7·4. It becomes evident, therefore, that in the winter season the least reliance may be placed upon the regularity of the motion of the weather-vane, as the number of points through which it passes is nearly equally great in all quarters. Among the single months, February, May, and August show an average of only 1·5 direct revolutions, the average number for one month throughout the year being 3·4. Speaking of the law of the shifting of the wind, it is of interest to refer back to the mean direction for the various quarters, by which we will at once perceive that the mean direction from one quarter to the next following one shifts in the sense which we called direct, as it moves from about W. by S. to S. by W., N.E. by E., N. by W., W. by S.

The diurnal variation in the direction of the wind exhibits some remarkable features, and in first considering the annual curve we shall find that the veering of the wind during the day time is direct and very evenly progressive, while at night time it moves in a retrograde sense. The amplitude of this oscillation has an angular value of 133° 37′, the extremes occurring at 5 h. a.m. in N. 4° 39′ W., and at 6 h. p.m. in S. 42° 4′ W. In the spring and summer months the value of the amplitude is far greater than the mean value given above, while during autumn and winter it sinks considerably below it. An exception occurs in the month of March, in which the curve of diurnal variation in the direction of the current of air shows irregularities similar to those in the month of September, both months representing maxima in the value of the daily amplitude.

In order to obtain a comprehensive idea of the general character of the winds, and a regular cyclus of the weather, the following sketch will be found useful:—

When the barometer is very high, and the temperature comparatively low, a light breeze is generally blowing from S.E., except in summer seasons, when the wind may be rather fierce from this quarter, then the polar current has set in, and the sky is lightly covered with cumulus clouds, the tension of positive electricity tolerably high. This is usually the case about midnight. Early in the morning the wind sinks to light airs, the barometer shows an inclination towards falling, more clouds cover the sky, and the wind blows now from the east. But this state of things does not last long. Cirri and cirro stratus make their appearance in the upper regions,

scattered over the sky. The barometer is sinking fast, while the temperature slightly rises, and the wind blows now with an increasing force from N.E., the positive electric tension decreases (3·6). Should the wind settle for some time in this quarter, as is usual in the winter season, it is accompanied by drizzling rain, fog, or heavy dew, but still increasing in force. It more frequently veers round to the north, and commences to blow with great violence towards 9 h. a.m., raising clouds of dust. The temperature is then considerably higher, while the pressure of air and electrical tension both decrease, the former to 29·82 on an average. The veil, which by this time is spread over the sky, becomes denser, and in summer season a hot wind has made its appearance, through which the temperature is raised occasionally to 111 degrees in shade, and the relative humidity reduced to 12 per cent. From the electrometer may be obtained vivid sparks of electricity, and the spontaneous evaporation during twenty-four hours may in such a case reach the great amount of 0·632 inches. The duration of a hot wind exceeds, exceptionally, two days; it lasts generally only six or seven hours, and the great oscillation of the vane towards west, and unsteadiness in pressure of air, indicate, about noon, the shifting of the current of air towards N.W. The sky is now partly covered with cumulo stratus, still showing, however, in the upper regions, cirro stratus, and the positive electricity becoming again more prevalent, between 3 h. and 4 h. p.m., a momentary lull occurs, after which the vane rapidly moves to W., W.S.W., and S.W., heavy nimbi covering the sky, and rain falling, first in heavy drops, afterwards descending steadily. The mercury, which had reached its minimum when the wind blew from N.N.W., rapidly rises now, while the thermometer frequently sinks in less than ten or fifteen minutes from 15 to 25 degrees. When the wind fiercely blows from S.W., rain descends in torrents, flashes of lightning illuminate the whole sky, and thunderstorms re-establish the equilibrium of atmospheric electricity. With a wind decreasing in force, and inclining towards south, the sky begins to clear, and the barometer continues to rise until it has again reached its maximum in S.E., with a low temperature, and thus is accomplished the skeleton cyclus of the weather, having occupied a period of eight or ten days. This is more the course of things in summer, and the adjoining parts of spring and autumn, while

in winter northerly winds prevail, as already stated, which after a period of calm weather, with a very low barometer, changes into strong winds from W.N.W., blowing in squalls, and being frequently accompanied by heavy showers and hail. The sudden shifts above alluded to from N.W. to S.W., are very dangerous to the navigator of this coast, particularly so in spring, when they may be expected at some distance from the coast at about 8h. p.m.

Whenever it blows from N.N.W. or N.W., the barometer, still falling, should be frequently observed, and as soon as the mercury becomes steady, and the wind is apparently lulling, we ought to prepare for the shifting of the wind towards S.W., which usually takes place with very great violence.

At a greater distance from the coast the time of shifting is later in the evening or early in the morning.

As already mentioned, gales from S.E. are frequent in the summer season, and generally commences with a pretty high barometer (29·88) and light variable airs and calms. Towards the height of the gale the mercury sinks, but slightly, and the wind is gradually dying away. The regularly decreasing pressure of air, with fine weather, after such a gale, should caution the navigator, as upon light winds from N.N.E. heavy squalls from W. will soon follow, bringing rain in abundance and hail storms.

On the eastern coast of this continent furious gales of a rotatory character blow during the winter season, chiefly June and July, from E. and E.S.E.; they are generally accompanied by exceedingly heavy rains and floods, and a very low atmospheric pressure; the vane moves in these instances through S.E., S., and S.W., the wind blowing with exceedingly great violence, and finally dying away in W.N.W. or N.W., with the mercury rising. The approach of these dangerous phenomena is indicated by a threatening, dirty-looking sky, and often by vivid flashes of lightning from the north, the sea tumbling at the same time dead upon the coast.

The hot winds form an important element in the climatology of the southern portion of the Australian continent, and a complete calendar of their occurrence, during the time systematic registration of meteorological facts has been carried on in these colonies, would be of the greatest interest; but we must, for obvious reasons, refrain from further entering into the subject, and conclude this part of the climatological outlines with a classification

of the various localities with respect to the number of hot winds occurring:—

Melbourne and Castlemaine ...	14	days of hot wind.
Sandhurst, Heathcote, and Portland	11	"
Beechworth, Ararat, and Swan Hill	8	"
Geelong and Ballaarat	6	"
Alberton and Camperdown ...	3	"

The average number of hot winds for the colony amounts to eight or nine per annum. At places towards the east of Port Phillip, mostly S.E. and E. winds blow during the time hot winds prevail towards the north, while in the plains near Camperdown the wind is from W. or S.W.

After having spoken so much of the general character of the system of winds to which this part of the continent belongs, we may abandon this subject for the present and pass on to another of the highest interest, and forming a most essential element of the climate of a country—the rain, its amount, duration, and distribution over the country throughout the various seasons. Let us first glance at the rainfall as observed in Melbourne, and examine somewhat more closely into its peculiarities before entering upon the distribution of rain over the country. The first question we meet with is the mean annual fall of rain derived from a series of observations, extending over as long a period as can be obtained, and next to it the oscillations in the yearly fall of rain for such a period. The following tables contain many facts conducive to valuable information on these points.

Annual Rainfall in Melbourne during the last 20 years.

Year.	Amount in inches	Difference of the amount of each year, and the mean fall of 17 years.	Year.	Amount in inches.	Difference of the amount of each year, and the mean fall of 17 years.
1840	22·57	− 5·47	1851	—	— —
1841	30·18	+ 2·14	1852	—	— —
1842	31·16	+ 3·12	1853	—	— —
1843	21·54	− 6·50	1854	—	— —
1844	28·26	+ 0·22	1855	28·21	+ 0·17
1845	23·93	− 4·11	1856	29·75	+ 1·71
1846	30·53	+ 2·49	1857	28·90	+ 0·86
1847	30·18	− 4·05	1858	26·02	− 2·02
1848	33·15	+ 5·11	1859	21·80	− 6·24
1849	44·25	+ 16·21	1860	25·40	− 2·64
1850	26·98	− 1·06			

It is greatly to be regretted that the valuable series of observations for 1840 to 1850 carried on in this colony, and published in the *New South Wales Gazette*, should have been interrupted by the separation of Victoria, as we otherwise might have been able to arrive at some conclusions with respect to the diminution of rain or periodicity in its fall. If we now compare the facts at our command, we find that the greater difference in rainfall for the years observed amount to 22·71 inches, furthermore, that the average rainfall for the last six years, from 1855–60, 26·679 inches, differs but slightly from the average fall of rain for any six consecutive years from 1840 to 1848, excluding the abnormal fall of rain of 1849.

Comparing the rainfall in different seasons within the periods 1840 and 1850, 1855 to 1860–1, we arrive at the following results with respect to the average fall of rain in each season:—

Quarters.	For the Periods between	
	1840–50.	1855–60–61.
	Inches.	Inches.
Spring	9·15	7·90
Summer ...	5·34	7·86
Autumn ...	7·65	6·46
Winter	7·02	4·94

We see by this table, that in both periods the fall in spring is the greatest, but there is a marked increase in the average fall of rain during the summer in the last period on that during the years 1840–50, while on the other hand there is a decrease in amount in the remaining quarters.

Observations on the exact duration and intensity of rain have only been carried on in this colony since March, 1858, and the results given on these points were derived from the set of observations made after that date, and from a careful examination of these the results given hereafter have been deduced. If we take the intensity of rain for winter equal to 1, we find that the intensity for spring, summer, and autumn, are respectively 1·65, 2·22, and 1·36, and the average number of hours of rain are, for spring, 139; for summer, 129; for autumn, 105; and for winter, 156. From these facts it would appear that the average number of hours of rain for the year is 532 at Melbourne; and if the rain in dura-

tion and amount were equally distributed over the year, it would then rain 1·48 hours each day, at a rate of 0·075 inches.

If we now examine into the connection between rain, and night and day time, we shall find the following interesting facts bearing upon the relative intensity, duration, and amount of rain. The values for the respective quantities at night being taken as equal to 1, we have for the various quantities in daytime:—

—	Amount.	Duration.	Intensity.
Spring	1·4	0·88	1·7
Summer	1·2	1·01	1·3
Autumn	1·1	0·85	1·3
Winter	1·1	0·80	1·3
Means for the year ...	1·2	0·88	1·4

In the year ending the 28th February, 1859, the amount of rain during the daytime was 13·668 inches, and during night, 10·246 inches. The two years following the rain in daytime was respectively 9·281 and 17·172, and that for night, 11·273 and 12·026 inches, which seems to indicate that the great variation in the rainfall was due chiefly to day showers, inasmuch as the amounts collected during night time for each year but slightly differ from each other, when compared with the great difference of the day rain.

It would be very valuable to subjoin here a calendar of the rainfall observed in Melbourne during the last six years, together with an examination of floods, but as such a register would probably become too extensive, a few interesting cases may suffice.

In 1855, on the 29th December, the amount of rain collected during two and a half hours was 0·92 inches.

In 1856, on the 23rd of September, during a thunderstorm lasting only twenty minutes, rain fell to the amount of 0·920 inches.

In 1857, on the 10th of February, 7 h. p.m., to the evening of the 11th, the fall of rain amounted to 3·420 inches.

In 1858, the rainfalls during December were particularly heavy; on the 19th it amounted to 1·623 inches during the afternoon.

In 1859, during a thunderstorm which occurred on the 8th of June, rain fell to the amount of 0·616 inches.

In 1860, on December 9th, the rainfall amounted, during twenty hours, to 2·586 inches; and

In 1861, on the 31st of January, to 2·370 inches during eleven hours.

Before leaving the subject of rainfall at Melbourne, there is a question of great utility which should attract our attention, namely, how much the annual spontaneous evaporation exceeds the fall of rain.

Observations carried on in Melbourne during 1859 and 1860 give the following results :—

Quarters.	Amount of	
	Rain.	Spontaneous Evaporation.
	Inches.	Inches.
Spring	6·940	12·052
Summer	6·412	19·058
Autumn	5·146	11·129
Winter	5·193	4·271
Year	23·691	46·510

This table shows that the annual evaporation for the two years mentioned is nearly double the amount of rain which fell, and that in spring and autumn nearly the same is the case, while in summer the evaporation is almost threefold the amount of rain, and in winter the latter exceeds the former. The spontaneous evaporation reaches its maximum in January, when it amounts to 7·003 inches, its minimum in monthly value, 1·260 inches, occurring in June.

It remains yet to speak of the distribution of rains throughout the colony, and as the practical utility of the knowledge of the same is so great, the rain table, as compiled from several years' observation, may find a place here; and it must be remembered, that the rainfall for all stations (with the exception of those expressly mentioned), was taken during the same period, to make them comparable, but by this it could not be avoided, that the quarterly rainfall for Melbourne should differ from that already given, as the same periods could not be made available in all instances.

Mean Rainfall throughout the Colony for the period from 1st March, 1858, to 29th February, 1860, inclusive.

Quarters.	Stations.										
	Ballaarat.	Camperdown.	Castlemaine.	Echuca.	Geelong.	Heathcote.	Melbourne.	Lake Burrumbeet.	Port Albert.	Portland.	Wimmera.
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch	Inch.	Inch.
Spring ...	6·10	7·80	4·18	5·25	4 65	4·57	6·52	9·38	7 49	6·70	4·98
Summer ...	4·64	4·23	5 90	4·33	4 22	5·24	7 12	4·56	6·86	3·16	2 66
Autumn ...	5 25	5·38	4·94	4·45	2 34	5·83	3·43	3·42	—	6·76	5·34
Winter ...	6·75	9·96	5 06	3·41	5·38	6·16	5·47	4 82	7 96	11 91	3·08
Year ...	22·74	27·37	20·08	17·44	16·59	21·80	22·54	28·18	—	28·53	16·06

As no complete set of observations on the rainfall at Wimmera and Echuca was at hand for the period above stated, the years 1859 and 1860 have been given for the two first stations, which may well be done without damaging the main object of this table, namely, the comparative amount of rain for the country, inasmuch as 1858 and 1860 closely correspond in the amount of rain registered. For Burrumbeet but one year, 1860, could be subjoined.

The frequency of fog and dew in Melbourne throughout the single quarters and the year, expressed in means derived from three years, 1858–59–60, is shown in the following table, while that of rain, as given above, may be repeated for better comparison :—

Quarters.	Mean Number of Hours of		
	Fog.	Dew.	Rain.
Spring	13	154	139
Summer...	10	129	129
Autumn	10	188	105
Winter	108	243	156
Year	141	714	529

With regard to another series of phenomena, closely connected with the fall of rain, the occurrence of thunderstorms, hailstorms, and the electrical state of our atmosphere generally, a few words may be added.

From a careful discussion of all registrations carried on during several years throughout the colony, it appears that the average

number of thunderstorms occurring within the colony of Victoria is sixteen, which are distributed over the year thus—five occur in spring, six in summer, three in autumn, and two in winter. The various localities may be arranged in four groups, of which the first, with twenty-six thunderstorms, embraces Ararat, Beechworth, and Melbourne; the second, with nineteen, Camperdown, Heathcote, and Alberton; the third, with thirteen, Ballaarat, Sandhurst, Castlemaine, and Portland; and the fourth, with but three, Geelong and Swan Hill; the latter result being however less reliable, as it was derived from one year's observation only, and is most likely somewhat too small. These thunderstorms are mostly exceedingly heavy, and accompanied by heavy showers of rain. In addition to these electrical discharges, lightning is frequently seen at short intervals, and it seems that the average number of days on which lightning only was to be seen, is according to Melbourne registrations, thirty-five: namely, twelve in spring, eight in summer, eight in autumn, and seven in winter; and particularly interesting in the fact, that in the months of August and September globular lightning is more frequent, both in the southern parts of the continent and the adjacent seas.

Hailstorms, which chiefly occur in the spring season and end of winter (although their appearance may be exceptionally looked for in summer also), are most frequently at Camperdown, the mean for two years amounting to nine single showers; while Beechworth shows six; Ballaarat, Heathcote, and Portland five; Melbourne and Swan Hill, four; Ararat, Castlemaine, and Sandhurst, three; and Port Albert, but one.

The hourly registrations of the atmospheric electricity, which have been carried on at the Flagstaff Hill Observatory with Quetelet's electrometer, give the following results after three years' continuation:—

Quarters.	Mean Tension Positive Electricity.	Mean Number of Registrations of Negative Electricity.	Mean Number of Registrations of No Electricity.
	Parts.		
Spring	3·12	159	186
Summer	2·64	242	248
Autumn	2·89	117	153
Winter	3·40	71	148
Year	3·01	589	735

The positive tension, being the normal state of atmospheric electricity, assumes its smallest value in the months of February and November, and its highest in the months of June and September, the range in the monthly mean amounting to 1·17 parts of division of the electrometer above mentioned. The electric tension is chiefly negative during hot winds, when clouds of dust are floating in the air, and during heavy rain; in latter cases the negative tension is frequently so great that vivid sparks may be obtained from the instrument.

The collation of the observations on the tension of positive atmospheric electricity, gives the following results with regard to the means for the even hours throughout the year, showing a daily amplitude of two to three parts of a division, the turning points of the same being at 8 a.m. and 3 p.m.

A.M.	Parts.	P.M.	Parts.
Midnight	2·97	Noon	2·13
2 h.	2·54	2 h.	2·72
4 h.	2·64	4 h.	1·92
6 h.	3·41	6 h.	3·03
8 h.	4·17	8 h.	3·52
10 h.	2·84	10 h.	3·36

Although observations on the ozonic reaction have been carried on at the various stations throughout the colony, the single sets are too imperfect as yet to admit of discussion with a view of illustrating the peculiarities of the different localities, with regard to this interesting, still somewhat mysterious element. For Melbourne it was found that the ozonic reaction is smaller with east winds, slightly increases with N. and N.W. winds, and reaches its maximum when the wind blows from S.W.; towards the east gradually decreasing again.

With regard to the seasons, and day and night, the amount of ozone shows with Schönbein's test paper:—

Quarters.	Ozonic Reaction.		
	Day.	Night.	Mean.
Spring	2·81	4·00	3·40
Summer	2·55	3·22	2·88
Autumn	3·73	4·03	3·88
Winter	3·55	4·19	3·87
Year	3·16	3·86	3·51

There seems also a distinct variation throughout the day in the amount of ozone, in addition to that already shown by the day and night registrations. Papers exposed during six hours give—

Between 6 a.m. and noon	1·59
" noon and 6 p.m.	1·63
" 6 p.m. and midnight	1·58
" midnight and 6 a.m.	1·70

of Schönbein's scala. It appears that between the hours of 6 h. and 9 h. p m. the amount is least, between 6 h. and 9 h. a.m. greatest.

With regard to the amount of cloud over the country throughout the year, the various localities may be divided into two groups: the one comprising all stations in which the mean amount for the year is greater than one-half of the whole sky; and the other comprising all those in which the mean amount is less than one-half.

In the first group appear Ballaarat, Camperdown, Geelong, Melbourne, Portland, and Port Albert, the yearly mean for this group being 5·61.

In the second are Beechworth, Castlemaine, Heathcote, and Sandhurst, with a yearly mean of 3·69.

The proportionate distribution of clouds throughout the seasons is very much the same in all stations, and is as follows:—Spring, 4·96; summer, 4·27; autumn, 4·71; winter, 5·42; which would give an annual mean amount of cloud of 4·84.

It appears, from several years' observations, that Camperdown shows a maximum in this respect for this colony, while Castlemaine and Sandhurst seem to be the clearest localities.

From the yearly means in amount of cloud for each hour of the day at Melbourne, we know that it is a minimum at 9 p.m., and a maximum at 7 a.m., being 5·13 and 6·51 respectively; and further, that the amount during daytime slightly exceeds that in night time, as for the former it amounts to 5·9, while for the latter it is only 5·5.

There is a peculiarity of our sky which renders it very unfavorable for certain astronomical observations—as, for instance, photometric observations—namely, that thin veil which so frequently spreads over the sky on or before days on which northerly winds prevail; its delicacy being frequently so great that the eye is barely able to discover it; if not, halos round the moon or the sun indicate its presence. To give an idea of its frequency, the

single number of halos as distributed over the year, according to Melbourne observations for 1858-9, is, for spring 17, for summer 26, for autumn 24, and for winter 26; the months in which they are more seldom seen being August and September, while they are most frequent in June. The circumstance that solar halos so easily escape notice when faint will cause the number of days on which they may be seen to be somewhat too small.

The connection between halos round the moon and sun and auroral displays and magnetic storms, &c., has been greatly advocated, and, without attempting the decision upon this point in this paper, a few facts bearing upon the subject may find a place here.

From three years' observations on magnetic disturbances and auroras it would appear that these phenomena are distributed over the year in the following manner :—

	1858.	1859.	1860.
From January to April	20	20	20
From May to August	19	33	14
From September to December ...	11	25	8
	50	68	42

If we substitute for the observations in 1858, from January to May, the number of days of disturbances in the years 1859 and 1860, we see by the preceding table that 1859 is particularly strongly represented in this respect; and this will be familiar to every body who witnessed the display of Aurora Australis in August and September of that year, the brilliancy of the then phenomena exceeding everything which had hitherto been observed in this part of the world.

The means of disturbed days for the single months tend to prove, at least for the period in consideration, that the least number of magnetic storms was in May and November (2), while August (8, 3) is represented as a maximum with regard to these phenomena.

A few words only on the daily oscillations in the magnetic declination. Here it is scarcely possible to give the angular values otherwise than approximately, without entering into a long discussion, as they greatly differ throughout the various years, attaining a maximum value in 1859; but as it may assist practical surveyors in making allowance for the hourly variations in the needle, we subjoin here some mean values for the curve of oscillation.

The magnetic declination (variation of the needle) reaches its minimum value for the day shortly after 9 h. a.m.; it then increases rapidly until 2 h. 20′ p.m., when it reaches its maximum. After this time it decreases rapidly towards 6 h. p.m., from thence slowly until after 1 h. a.m., when it again slightly increases to 4 h. a.m , thence falling to its minimum.

The corrections to be applied to reduce the needle to its mean reading for the day, is here approximately given for the even hours in the year:—

A.M.			P.M.
Midnight.—0·9′ ...	...	... Noon	+ 0·8′
2 h. — 0·4′ ...	...	...	+ 4·3′
4 h. + 0·2′ ...	...	...	+ 3·1′
6 h. — 0·7′ ...	...	...	+ 0·7′
8 h. — 3·2′ ...	...	...	+ 0·1′
10 h. — 3·6′ ...	...	...	— 0·6′

As the greater part of these outlines is based upon observations taken during 1858, 1859, and 1860, we give here the values of the magnetic elements, as determined at the Flagstaff Observatory for about the middle of that period:—

For the period between 1st and 7th June,	8°30·5′	East declination.
and	2·3622	(Gauss's Unit) Horizontal Force.

The inclination was determined on 1st of April, when it amounted to 67° 8′ South.

Refraining from entering into a discussion on the phenomena of Terrestrial Magnetism peculiar to this country, as it would too much deviate from the scope of this paper, it must suffice to give here the Magnetic Declination for various parts of the colony such as may prove to be of great practical utility:—

Ballaarat	8° 7′ E.	Little River, Rothwell ...	8° 32′ E.
Belfast	7° 36′ E.	Longenong	7° 33′ E.
Blackwood	8° 43′ E.	Melbourne (New Observ.)	8° 40′ E.
Camperdown	7° 41′ E.	Moonpool	7° 33′ E.
Cressy	8° 3′ E.	Pine Plains	7° 26′ E.
Cummins (Sydney road)	8° 36′ E.	Pitfield	8° 7′ E.
Euston pond	7° 18′ E.	Portland	7° 31′ E.
Footcray	8° 32′ E.	Queenscliff	8° 56′ E.
Geelong	9° 0′ E.	Swan Hill	7° 43′ E.
Glenorchy	7° 54′ E.	Warnambool	7° 55′ E.
Greenhills, near Ballaarat	8° 19′ E.	Upper Regions, Wimmera	7° 46′ E.
Lake Hindmarsh (North end)	7° 24′ E.	Yellanjip	7° 18′ E.

To these few facts on Terrestrial Magnetism may be added some few remarks on another subject, though not strictly bearing upon the Physical Geography of this country, but replete with so much interest that it will be received with great satisfaction by all interested in the advancement of science. It is on the periodical appearance of meteors or shooting stars, we feel desirous of making the concluding remarks to this short sketch. Little or nothing has been hitherto known about the periodicity of shooting stars in the southern hemisphere; and the scanty observations on this subject were insufficient to decide the question as to whether such periods of greater frequency of meteors for the southern hemisphere are identical with those of the northern, and whether the points of radiation from whence they issue coincide in both hemispheres. Sixteen hundred single meteors have been registered at the Flagstaff Observatory during the last four years, by which we are enabled to answer at least some of the questions alluded to.

The annual curve for frequency of meteors resemble in some respects that already laid down for the northern hemisphere, and the following series will give its general character. The figures denote the mean number of meteors seen during an hour in each month.

January	2·9	April	1·37	July	3.20	October	3·01
February	1·84	May	2·7	August	3·16	November	2·21
March	1·56	June	3·03	September	2·67	December	2·9

Neither with regard to the great period of shooting stars in August, nor with regard to that in November, does the southern hemisphere correspond with the northern, inasmuch as on both occasions but few meteors may be seen, while on the other hand the period between the 16th July and the 1st of August makes itself manifest as one of the maxima in the appearance of meteors, though they seem mostly not very bright. Other times of the year in which shooting stars occur frequently are—

Between January	the 25th and January	the 27th.
„ June	the 2nd and June	the 10th.
„ July	the 2nd and July	the 4th.
„ August	the 13th and August	the 18th.
„ August	the 31st and September	the 4th.
„ December	the 11th and December	the 13th.
„ December	the 23rd and December	the 25th.

The number of these periods will undoubtedly be still reduced.

As points of radiation may be mentioned, though their position may be slightly changed by discussion of the observations already made—

In 37°	South declination	and	13 h. 53 m.	right ascension.
In 51°	"	"	9 h. 54 m.	"
In 62°	"	"	6 h. 0 m.	"

ON THE ANCIENT AND RECENT

NATURAL HISTORY OF VICTORIA:

BY

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THE most extraordinary character of the Recent Fauna (or general group of existing animals) of Australia is the appearance of isolation from the types inhabiting other parts of the world, produced by the great number of species belonging to genera not found in any other country, and by a large proportion of the species not only belonging to genera peculiar to the place, but these generic groups being frequently separated from the genera of animals inhabiting similar latitudes, existing under similar circumstances, and performing the same vital functions elsewhere, by characters of such high ordinal importance as to indicate families, tribes, and even orders, not found elsewhere; and sometimes even affording the only examples of strange departure from the general anatomical plan on which all other animals are formed. It is a point of the highest interest to ascertain, by the aid of palæontology, how far back in the earth's history this isolation dated from; and on this point I purpose offering a few preliminary remarks, as the space allowed for the notice on Ancient and Modern Natural History of Victoria precludes the possibility of entering on extended specific details.

Nearly all the great geological works draw attention to the fact, that in the Oolitic rocks of England bones and teeth are found indicating the former existence there of marsupial or pouch-bearing animals of the same family as the common bandicoot (*Perameles*) of Australia generally, and of the *Myrmecobius* of

South Australia particularly; such types of general structure of insectivorous marsupialia, existing nowhere now on the face of the earth except in Australia, and these fossil bones near Oxford are accompanied by myriads of marine shells of the genus *Trigonia*, a genus not now existing in any other than the Australian seas, where four species of it are not uncommon. Such facts are very commonly received as indicating a continuance to the present day in Australia of the Fauna which disappeared in all the rest of the world with the close of the mesozoic period; and this again carrying with it the belief that Australia was the most ancient country in existence, having remained as dry land above the level of the sea for a period corresponding to that in which all the mesozoic and cainozoic formations of the rest of the world were being deposited. I am enabled to state that there is no sufficient foundation for this theory, from the great quantity of fossils which I have lately examined as Palæontologist to the Geological Survey of Victoria; and from evidence of this kind I can offer a sketch of the ancient successive changes of organic life in this country.

SECTION I.—PALÆOZOIC PERIOD, OR THE EARLIEST DAWN OF LIFE.

The Azoic rocks, I can now state, were succeeded in Victoria exactly as in Wales, Sweden, North America, and other parts of the world in the northern hemisphere, by a series of rocks enclosing fossil remains of the well-known genera, and even specific types of animal life characterizing those most ancient fossiliferous strata termed Lower Silurian by Sir R. Murchison, and Cambrian by Professor Sedgwick. In the slates, north of Melbourne, containing the auriferous quartz-veins of the gold fields, I have recognized abundance of the double graptolites for which I formerly proposed the genus *Diplograpsus*, so characteristic of strata of this age; and what is curious, I have found of this genus no peculiar or new species, but, on the contrary, the identical forms so abundant in the northern hemisphere; thus the most abundant and widely distributed species in Victoria is the *Diplograpsus pristis*, perfectly identical with specimens occurring in the slates of Scotland, Wales, Ireland, Bohemia, Sweden, New York, and Canada; the

next most common is the *D. mucronatus* of Hall, so abundant in the Utica slates of New York, and which I also recognized in the slates in Ayrshire and Radnorshire; the *D. rectangularis* (McCoy) is the next most common Victorian species, and perfectly undistinguishable from those I originally described from the slates of Dumfriesshire; the *D. ramosus* (Hall) described by the American Palæontologist from the "Utica slates," near Albany, but which I also detected in Scotland, is likewise represented by well preserved specimens in the National Museum from our strata, although a rarer species than the others. The forms called *D. folium* and *D. bicornis* in Europe and America also occur. Of the short, leaf-shaped, graptolites allied to the *D. folium* of Hisinger and *D. ovatus* of Barrande, from those ancient beds in Sweden and Bohemia, for which Professor Hall has recently founded the sub-genus *Phyllograptus*, I can identify in the utmost profusion in several localities north of Melbourne his typical species *P. typus*, which he describes as so abundant in the similar slates of Canada, in the Decades of the Palæontology prepared by him to illustrate this portion of Sir W. Logan's Geological Survey of Canada; and it occurs in Victoria in all the extremes of varied form which he describes it to assume in America. Of the twin-graptolites for which I formerly proposed the genus *Didymograpsus* (also characteristic of strata below the Upper Silurian) we have in Victoria the *D. serratulus* (Hall) identical with that from the New York slates, the *D. caduceus* (Salter) identical with his Quebec examples, is very common, and the *D. furcatus* (Hall) identical with the New York "Utica slate" species also occurs though more rarely. Also those compound species the *Graptolites gracilis* (Hall) exactly identical with the New York and Canada forms, and, more curious still, we have many of those extraordinary compound radiating forms, the *Graptolites Logani* (Hall) *G. quadribrachiatus* and *G. octobrachiatus* (Hall) so recently discovered in abundance in Canada, and peculiar to that country, except for the present announcement of their occurring in Victoria in the slates at Castlemaine. Of the simple, or doubtfully twin, graptolites, I have also determined the *Graptolites Ludensis* (Murch.) *G. tenuis*, (Portlock), *G. latus* (McCoy), and *G. sagittarius* (Hisinger), occurring in various localities within a hundred miles north of Melbourne in abundance of well preserved specimens, identical in every respect with specimens of the same

species occurring in the similar slates in Wales, Scotland, and Ireland. In Victoria, as in most of the European and American graptolite localities, the slates containing abundance of these bodies frequently contain no organic remains of Mollusca; one of the exceptions to this rule occurs in the black graptolite slate of Pen Cerrig, near Builth, in Radnorshire, where with the graptolites *D. mucronatus* and *D. pristis*, I discovered in 1851 an immense profusion of a small Brachiopod shell which I published under the name of *Siphonotreta micula*. European geologists in general will, I have no doubt, be as much astonished as I was to recognize exactly the same graptolites accompanied by the same little brachiopod shell in the similar black slates of the Deep Creek section, north of Melbourne. The characteristic genus *Hymenocaris* of these ancient beds in Wales also occurs here in a peculiar species *H. Salteri* (McCoy). In many other neighboring localities I have recognized so many of the ordinary Bala and Snowdon fossils as to enable me to suggest the mapping of the Bala beds to the geological survey; and over them are clear representatives of the Mayhill sandstone. But confining ourselves to the details now first made known of the contents of the graptolite beds, we have the astonishing fact of the *specific identity* of the *marine Fauna over the whole* world during the most ancient palæozoic period; this had already been recognized over an extended area in the northern hemisphere, but the extension with the present detail to the southern hemisphere cannot fail to give rise to the most interesting geological speculations. I now proceed to give the first distinct announcement, based on specific identifications, of the existence of the Upper Silurian formation in the southern hemisphere, and here too geologists will learn with interest the fact that at Broadhurst Creek, in Victoria, the rocks are filled exclusively with a profusion of specimens of the Wenlock Shale Trilobite, the *Phacops (Odontochile) longicaudatus*, so abundant at Cheney Longville, in Shropshire, and many Wenlock Shale localities in Britain; and the cuttings in Johnston-street, in Melbourne, have afforded us the *Orthoceras bullatum* so abundant a Ludlow rock fossil in Wales. Here again we can point now for the first time to the marvellous fact of the specific identity of the inhabitants of the seas of the most widely distant points of the northern and southern hemispheres during this second great geological epoch of the zoological history of the earth.

SECTION II.—UPPER PALÆOZOIC PERIOD.

Professor Morris, Professor Dana, and myself have formerly pointed out a considerable but more general resemblance between the Upper Palæozoic rocks underlying the coal beds of New South Wales and Tasmania, and the lower part of the carboniferous limestone formation of the old world (there having as yet been no distinct identifiations to prove the existence in Australia of the intermediate Middle Palæozoic or Devonian formations). Here we have the extinction of the characteristic Trilobites, Graptolites, Corals, and Mollusca, marking the Cambrian and Silurian epochs in Europe and North America, as well as in Victoria, at the close of those periods occurring in the southern hemisphere synchronously with this great change in the northern half of the world, and the new generic creations marking the upper Palæozoic period, succeeding them similarly at this fourth great step in the creative changes of the earth in Australia, as at the antipodes. Thus amongst the palæontologically important class the *Crustaca*, the genera *Phacops*, *Odontochile*, *Portlockia*, *Calymene*, and *Beyrichia*, which abound in the lower palæozoic rocks of Victoria as in Wales, are replaced by *Phillipsia*, *Brachymetopus*, and *Bairdia*, crustacean genera characteristically distinguishing the carboniferous rocks in England and Russia from the earlier lower Palæozoic beds; again, amongst the Brachiopodous Mollusca, numerous species of the genus *Producta* characteristically separate at a glance the carboniferous formations of Europe and America from the lower Palæozoic rocks; and exactly the same geological date marks the appearance of the same genus in the rocks of Victoria. Then again, in the vegetable kingdom, the carboniferous upper Palæozoic period is strikingly distinguished from the lower Palæozoic deposits by the various sections of the great genus *Lepidodendron* and its related forms. I rejoice to be able to announce that in Victoria this period is similarly marked by a large distinct species of one of the sections of *Lepidodendron*, which I identified in a block of sandstone collected, without other fossils, by Mr. McMillan from the Avon Ranges in Gipps Land. This fossil is of the same species as the only *Palæozoic coal plant* ever collected in New South Wales, where it was found by the lamented

Leichardt near the borders of Queensland, on the Manilla River, fully two hundred miles north of the localities which had afforded the plants associated with the coal of the Hunter and other parts of New South Wales, which I believe to be Mesozoic, and by him given to the Rev. W. Clarke of Sydney, who sent it to me about twelve years ago for determination during the controversy as to the the age of the plant beds of the Newcastle, New South Wales coal beds, on which occasion I confidently pronounced, not only that it was a true Palæozoic coal plant, but that it never came from the beds in dispute—in which latter point I now find I was correct. To my friend, Sir Charles Lyell, as well as to other geologists, I believe this identification of a true Palæozoic carboniferous flora in Gipps Land will be of the highest interest, from the ingenious theory which they suggested to reconcile the difficulties arising from Professor Morris and myself having indicated the strong connection between the plant beds associated with the coal of New South Wales and the Mesozoic coal deposits of Europe, while we both agreed that the underlying marine beds were clearly lower carboniferous (Palæozoic) and the Rev. Mr. Clarke insisted that they were all of one age. The theory was this, that possibly, owing to the immense geographical distance between Australia and the typical sections of Europe, the plants growing on the land might have been those of the Oolitic period, while the sea contained the living inhabitants characteristic of the Palæozoic times. I combated this theory at the time by pointing to the similar mesozoic coal plants in Richmond, Virginia, at no great distance from the usual Palæozoic coal flora of other American coal fields, both remote from the typical European sections of the two coal floras, but distinct. Nothing can, however, exceed the geological interest attaching to the distinct announcement I am now able to make of the first appearance of land vegetation in the extreme remoteness of the upper Palæozoic times in Australia, having been formed absolutely on the same type as that of the same period in the northern hemisphere; and here I am able to advance another step in the comparison between the Ancient and Modern Natural History of Victoria and that of the antipodes, by showing that the wonderful identity in the marine fauna of the two hemispheres during the Palæozoic periods applied also to the productions of the dry land, which latter is also now shown to have emerged at the same period

in Australia, as the greater bulk of first dry land in Europe and America (the Devonian evidence being small exceptions to the otherwise first great appearance of dry inhabited land during the carboniferous period).

SECTION III.—MESOZOIC PERIOD.

The evidence of Mesozoic formations in Australia has been much disputed, resting until lately only on the characters of the fossil plants associated with the coal of New South Wales and Tasmania. This plant evidence is much more forcible now than ever, inasmuch as I have had opportunities of carefully investigating the fossil plants associated with coal seams in Victoria, at Cape Patterson and Bellerine, and for this colony I can now not only emphatically repeat the arguments which I used fourteen years ago, when writing on the plants associated with the coal of New South Wales* and Tasmania, namely, that all of the genera and some of the species were closely allied to, or identical with, those of mesozoic coal beds, and that *all the characteristic palæozoic coal genera as Calamites, Lepidodendron, Sigillaria, Stigmaria,* &c., were completely absent, but I can add the very important fact that the ***Pecopteris Australis*** (certainly identical with an Indian species from the Rajhmahal beds) with the ***Phyllotheca*** and other well known plants of the beds associated with the coal in New South Wales and Tasmania and Victoria, are associated with numerous species of genera and even families of plants highly characteristic of the Mesozoic and more recent (as distinguished from the older) eras. Thus I have characterized four very distinct species of *Zamites* in the Bellerine beds, one only being rare (the *Z. ellipticus* [McCoy], so called from its broad ovate leaflets), the three others being abundant; of those the most strongly marked is the *Zamites Barklyi* which I have dedicated to His Excellency the Governor in commemoration of the lively interest he has taken in the geology of the colony, and another, the *Zamites longifolius,* (McCoy), I have also seen from the New South Wales beds. No *Cycadeous* plants are known anywhere in true palæozoic coal beds.†

* Annals of Nat. Hist., Vol. xx., 1847.
† The apparent exceptions to be found in some books being obvious erroneous determinations when investigated.

I have also characterized a species of *Tæniopteris* almost identical with the *T. vittata* of the Yorkshire (Scarborough) Oolitic coal beds, and which I have described in a paper before the Royal Society of Victoria under the name *Tæniopteris Daintreei*, after the gentleman who first collected it from the rocks associated with the coal of Cape Patterson, and it also occurs commonly in the two other mesozoic coal localities near Melbourne, the Barrabool Hills, and Bellerine. As the Baron de Zigno in his recent writings on the Jurassic Fossil Flora, adopts my view instead of the Rev. Mr. Clarke's, as to the mesozoic age of these Australian plant beds, because, as he says, the early statements of that gentleman, that the various characteristic palæozoic genera *Lepidodendron Sigillaria*, &c., occurred abundantly with them, had not been verified, it will be of high interest to European geologists to learn that up to the moment at which I write no trace of them has ever been found in *the beds* containing the *Glossopteris, Phyllotheca, Pecopteris Australis*, the *Tæniopteris*, or the *Zamites;* and that the only *Lepidodendron* or characteristic palæozoic carboniferous genus found *was many miles from the beds containing the (as I believe) mesozoic plants, and not mixed with them.* One argument used by the Rev. Mr. Clarke against the mesozoic age of these plant beds was the supposed absence of marine mesozoic fossils in Australia, but even this argument (of no value as I pointed out by a reference to Richmond, Virginia) has failed within the last few weeks, for a friend of Mr. Clarke's having collected a number of fossils from Wollumbilla, the latter gentleman sent them to Melbourne with a request that I "would determine the geological epoch to which they belonged;" and here without at all entering on the description of the species, I can state that they furnish a most complete answer to the objection, and are the marine equivalents of exactly the same age as that I assign to the plant beds, *i. e.*, lower mesozoic, not older than the base of the Trias, and not younger, I think, than the lower part of the great Oolite. The collection contains large *Belemnites* of the general aspect of *B. giganteus, B. paxillosus* and similar lias and lower oolite forms, *Pentacrinus*, and a number of species of large *Serpula, Lima, Pecten, Arca, Nucula, Rhynchonella*, &c., having the general facies of lower oolitic, liassic, and triassic, forms. And thus we reach the next great onward step in our attempt at a comparison of the Natural History of Australia and other countries in the ancient

periods, the history of whose creations can only be traced by Palæontology; and we find that at this oolite epoch to which allusion was made at the commencement of this paper, the whole facies of the fauna of the sea and the flora of the land had undergone just such changes as marked the geologically corresponding creations in India, Yorkshire, Germany, and America. I may remark that in the Wollumbilla fossils there are no *Trigoniæ*, although from the remarks in the first paragraph it is obvious English geologists would expect them, but in their place I recognized a distinct species of Professor Bronn's muschelkalk genus *Myaphoria*, enabling me to suggest on palæontological grounds the presence of triassic beds in Australia.

SECTION IV.—TERTIARY PERIOD.

The next epoch in the Ancient Natural History of Australia represented by the deposition of the widely-spread tertiary formations, could not have been contemplated by those who indulged in the speculations referred to in the beginning of this paper, for we find that here as in Europe, the greater part of the country sank under the sea during the Tertiary period, and every trace of the previous creations of plants and animals was destroyed and replaced by a totally different new set, both of plants and animals, more nearly related to those now occupying the land and sea of the country. This, then, quite puts an end to the speculations based on the supposition that Australia, unlike the rest of the world, had remained as dry land since the oolitic period, and that the living little *Myrmecobius* and *Perameles* or *Bandicoots* were the associates of those little marsupials which lived in the time of the depositions of the Stonesfield or Collyweston slate of the Oolitic period in England. The fact really is, that in Victoria there is a rich Tertiary Dicotyledonous Flora, totally unlike the Mesozoic one; and in Victoria, as in New Zealand, India, North and South America, and Europe, the races of animals now inhabiting the land were preceded in the most recent Tertiary or Pleistocene time by gigantic antetypes as it were, characterized by the same anatomical peculiarities which mark the recent inhabitants of the place. Thus as New Zealand had her little Kiwis or *Apteryx*

preceded by an equally wingless but gigantic bird, the Moa or Dinornis, and South America had her existing peculiar little sloths preceded by the colossal *Megatherium* and *Mylodon*, presenting the same peculiarities of anatomical conformation; so the Wombat and Kangaroo, the most peculiarly characteristic genera now inhabiting Australia, were preceded by the gigantic *Diprotodon* and *Nototherium* in some measure uniting the osteological peculiarities of those genera, and their bones are found like those of the extinct gigantic Irish Elk (*Megaceras*) of the same period, apparently bogged or mired in the mud of the ancient *Pleistocene* lakes. With these at Lake Timboon and other localities in Victoria, true kangaroo (*Macropus*) are found, (*M. Titan*) of a size greatly exceeding the living ones. With these, in some of the caverns as at Mount Macedon, are found remains of recent species of *Hypsiprymnus*, *Hydromys*, and the carnivorous *Dasyuri* and the *Canis dingo* or native dog, the recognition of which latter, I think, settles the point of its being truly an indigenous animal. I have likewise recognized the bones of the Wombat (*Phascolomys*) in the solid, hard, stony, ferruginous, auriferous drift called "cement" by the gold diggers, at a great depth in the sinkings at Dunolly, the material being so hard that the jaws could only be cleared by a stonemason's chisel; this determination enables me to say that the age of the gold drift of Victoria, like that of Russia, is as Sir R. Murchison showed for the latter country, that of the "mammaliferous crag" of England.

The marine Tertiary Fauna of Victoria is highly interesting in a Natural History point of view from the extraordinary evidence it affords of the "law of representation, or representative forms" which it presents. Thus a series of beds about ten or twelve miles from Geelong, which I believe to be Lower Miocene, and a series of beds on the opposite shore of Hobson's Bay, between Mount Eliza and Mount Martha, which I believe to be Upper Eocene, present the most extraordinary series of species of *Voluta* representative of those of the Eocene clay of Bartoncliff, in Hampshire, and of the Miocene beds of the basins of Paris and Vienna that can be conceived; the *V. spinosa*, *V. modesta*, and *V. suturalis* of the European Miocene beds are so exactly represented by species in the Geelong beds, that it requires a close examination to perceive the difference, and similarly the English and French series of Eocene species *V. luctatrix*, *V. spinosa*, *V. lyra*, *V. ambigua*,

and *V. digitalina* are "*represented*" in the most curious and exact manner by a similar series of species in the Victorian beds, having the same relations of form between themselves, and specifically almost undistinguishable at first sight from their northern analogues—the likeness being rendered stronger by the recognition of this complete parallel series in each hemisphere; and yet there is a minute difference (considered generic by some writers) separating the two series from each other, the Eocene Tertiary volutes of Europe having a regular sharp-pointed spire and forming the genus *Volutilites* of Swainson, while the Australian "*analogues*" have the distorted mammillated tip to the spire characteristic of the recent *Volutidæ*. Then again the common *Cassidaria depressa* of the Lower Miocene of Germany is so exactly represented by an equally common species in our beds of the same age, which I have named *Cassidaria reticulospira*, that the two can only be distinguished by the character indicated, of a reticulation of the extreme whorls of the spire. The *Trivia avellana* of the same European beds is exactly replaced by the almost identical *Trivia avellanoides* (McCoy) in the Victorian beds, and so on through a long series of representative forms, giving us the first distinct proof in our progressive sketch of the development of life in Victoria of the action of the "law of representation of specific centres" which plays so important a part in the distribution of organic life on our globe at the present day, but which as we have seen, apparently had no effect in the more ancient times.

As bearing upon that question of great interest to the European geologist, the palæontological evidence of progressive changes of temperature in our earth, geologists will be interested to know that as the living species in the European Miocene Tertiaries are generally inhabitants not of the neighboring seas but of more southern warmer latitudes, so I observe exactly the same fact in Victoria, the recent shells mingled with the extinct ones in our Miocene deposits being usually forms not living in our bay or in the adjacent seas, but inhabitants of New Zealand (as the *Pectunculus laticostatus* which is common in the fossil state with us though not now living nearer than New Zealand) and the warmer latitudes of Adelaide and Northern Australia. Thus showing here as in Europe the gradual cooling of our globe during the Eocene and Miocene periods. To refer again to the mistaken popular theory alluded to in the first paragraph in which the suggestion is

dwelt on of the present existence in the Australian seas of the possibly Oolitic *Trigoniæ*, I think it of great interest to state that the four living species of *Trigonia* seem to have been created only during the modern period, and are represented in our Australian Tertiary deposits by a totally distinct species, the *Trigonia semiundulata* (McCoy).

SECTION V.—RECENT PERIOD.

As the space assigned to me has been far exceeded, I can only offer a few remarks on the Existing or Recent Natural History of the country which is so much better known than that which has preceded. The Recent Mammalia and Birds of Australia are so fully known from the admirable works of my friend Mr. Gould that I shall not allude at all to them, further than to correct an error which seems to be universal in books, and occurs even in the memoirs of Mr. Ronald Gunn, of Tasmania, namely that the large *Dasyurus maculatus* is only found in Tasmania and not on the Australian main land; I have had seven or eight specimens collected for the National Museum from the Yarra Mountains and other hilly localities within thirty or forty miles from Melbourne; and that contrary to my preconceived opinion I have satisfied myself that the native dog (*Canis dingo*) is truly an indigenous animal, from the double reason of its increasing in numbers (with little variety) towards the interior of the continent remote from man, and having identified its bones mingled with those of recent and extinct animals all in one state of preservation in the bone caverns recently opened beneath the basalt flows at Mount Macedon.

Of *Reptilia* the great *Hydrosaurus varius*, called Iguana by the colonists, and often five feet in length, is the most important of the *Lacertilia*; several smaller types are also common near the coast, as the *Hinnulia tæniolata*, *Cyclodus gigas*, and *Grammatophora muricata;* the *Agama barbata* and *Trachydosaurus rugosus* (called jew, or dew, lizard by the colonists) become gradually common as you approach the warmer country, near the northern boundary of the colony, but do not occur, I believe, south of the dividing range. Of *Batrachia* the *Ranhyla aurea* is the exceedingly common green frog of the country, and is so unlike *Hyla* in

its habits, which agree completely with *Rana*, that its generic separation from *Hyla* (contrary to the opinion of several able authorities) is I think quite necessary. In two other frogs, species of *Lymnodynastes*, the unexpected habit is found, in this arid waterless country, of habitually living buried to a considerable depth in the sandy ground during the day, coming up to feed by night, when in their turn they furnish food to the snakes on the dry plains. The *Chelonian* reptiles are not found nearer than the River Murray, where the only species known *Chelodina longicollis* and *C. Oblonga* are those described by my friend Dr. J. E. Gray, of the British Museum, to whom our National Museum is so greatly indebted for the most valuable and friendly aid. The Snakes of the colony are rather numerous, and all, with one exception, poisonous, and that exception the Carpet Snake (*Morelia variegata*) is only found in the warmer northern part of the colony. On the other hand, the venomous snakes, properly so called, with isolated fangs, are scarcely found, the only example of Australian *Viperidæ* being the Death or Deaf Adder of colonists, the *Acanthophis antarctica* being extremely rare in Victoria, and only found in the warm districts near the northern boundary. The rest of the snakes belong to the *Colubridæ*, and as the snakes of Victoria have not yet been enumerated, I may just mention those I have ascertained. The *Hoplocephalus superbus* is a very abundant snake, near Melbourne, and this poisonous snake is often unfortunately referred to erroneously under the name of "diamond snake" in accounts of experiments on the bites of poisonous snakes and on antidotes; the true, harmless, Diamond snake (*Morelia spilotes*) of New South Wales, not having as yet been observed in the colony of Victoria. The *Hoplocephalus curtus* is a still more abundant and venomous species around Melbourne, where it is usually called "tiger snake" from the brown transverse banding of most specimens; it differs remarkably from all the others of the genus in its power of dilating the sides of the neck when irritated into a broad, flat, leaf-like hood as in the Cobra. These two species become more rare towards the north, not having been observed in the warmer regions. *Hoplocephalus Gouldi* is extremely rare, I having only seen one Victorian specimen, it being here replaced by the only new species I have met with, namely the *Hoplocephalus flagellum* (McCoy), the common little "whip snake" of the

colonists, having nineteen and seventeen rows of scales as constantly as its representative in West Australia has fifteen. The beautiful little *H. coronoides* of Tasmania also occurs in Victoria, but is rare. Of *Diemansia* we have only one species, the *D. reticulata*, one of the commonest of the small snakes towards the Murray boundary of the colony, but not found in the cooler localities towards the southern coast. The beautiful "black snake" of the colonists (*Pseudechys porphyraicus*) is a formidable and very poisonous species, but has become very rare of late years in Victoria. The most dangerous of all the snakes of the colony, both from its size, usually about five feet, its abundant distribution everywhere through the colony, and the fatal venom of its bite, frequently killing dogs and occasionally men, is the "brown snake" of colonists, the *Pseudonaja nuchalis*, closely related to the *Naja* or cobra of India. The statement published in Melbourne some years ago of the occurrence of a species of true *Boa* in Victoria, only rested on a mistaken determination of the common carpet snake (*Morelia variegata*) in which the obvious characters which distinguish the *Pythons* of India, Africa, and Australia, from the true *Boas* confined to America were overlooked.

In the class of fishes many species remain yet to be determined. The more important species used as food are the snapper of colonists (*Pagrus unicolor*), abundant and often of great size, with large numbers of which the market is regularly supplied, and which is caught and dried in great quantities by the Chinese fishermen in Hobson's Bay, and supplied to their countrymen on the various gold fields. The next most important species from its being almost equally abundant at times in the market, and of equally large size and superior flavor, is the great cod-perch, the Murray cod, of colonists—the *Grystes Peeli* of Mitchell, or *Oligorus Macquariensis* of modern writers. A very much larger (occasionally five feet in length) and finer fish for the table; only an occasional visitor however, is the king fish, of colonists, which seems to me completely identical with the great maigre of the Mediterranean, *Sciæna aquila;* Dr. Gunther, the most recent European writer on Ichthyology in his general catalogue of Acanthopterygian Fishes, states that the family *Sciænidæ* to which this fish belongs has never been found in Australia. The fishes commonly called mullet (*Dajanus Diemensis*), and Whiting by the colonists (*Sillago punctata*), are common in the fish shops for the

table, together with three species of flathead, *Platycephalus nematophthalmus, P. tasmanius,* and *lævigatus,* which are caught abundantly in the bay at all times. Another tolerably good table-fish is known to the colonists, and is found in the market under the name of Pike, though like all the other fishes bearing the name of English species, it has little resemblance and no affinity to the fish of that name in Europe, it is the *Sphyræna obtusata* and *S. Novæ Hollandiæ.* The so-called Herring of the fishermen, is the *Centropristis Georgianus,* with which the market is also abundantly supplied. The Baracoota which visits us regularly, and is in some request for the table, is certainly the Cape of Good Hope *Thyrsites atun.* The small Ling, the *Lota breviuscula,* is occasionally procured for food on the coast, but is chiefly remarkable for the old full-grown fish, (about a foot long), having two or three years ago, been stated by some fishermen to be the young of the great Newfoundland cod; it was in vain that I pointed out the generic difference in the number of the fins, &c., and that those supposed young were really adult, the "practical men" carried conviction so far with them, that the merchants of the town subscribed some hundreds of pounds, twice, to fit out a vessel to commence a great cod-fishing, on a supposed cod-bank a few miles out, as a mercantile speculation.

The Dory (*Zeus faber*), is a rare visitant, and whether as delicious here as in Europe I cannot say, for although a party of my scientific friends actually ate one of the three specimens I have known to have occurred during the seven years I have been in the colony, instead of sending it to the Museum, they had too much grace to tell me what it was like. A Guard-fish (*Hemirhamphus*), a Tunny (*Thyunus*), and an Eel (*Muræna*), are also commonly used for food. Amongst useful fishes not good for food, I may mention the common European Sunfish (*Orthagoriscus Mola*), as not uncommonly caught in the bay, for its large supply of oil.

Of Crustacea few kinds are used for food in Victoria; there are no true lobsters and no crabs (*Canceridæ*) fit for the table*; but a spiny crayfish of about the same size and shape as the English species is very common at the Heads and is supplied abundantly to the market; it is nearly or quite identical with the *H. annulicornis;* the gigantic Murray river crayfish (the *Astacoides serratus*),

* Since writing the above an example of the enormous *Pseudocarcinus gigas* has occurred within the shores of the colony near Portland, and has been preserved for the Exhibition.

is now sent down alive in great numbers to the market for the table; the smaller river crayfish (the *Astacoides quinquecarinatus*), is also often eaten in the country but is not sent to market; it forms the chief food of the so-called Murray cod, from the stomach of one of which I took twenty nearly perfect.

As the original space allotted to me for this note on the Ancient and Recent Natural History was only eight pages, I cannot trespass further by entering on any consideration of the other classes of animals.

University, 30th September, 1861.

GEOLOGY

OF THE COLONY OF VICTORIA,

BY

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The researches that have been made into the geological structure of Victoria show that over by far the larger portion of its area the surface is occupied by stratified rocks referable to two only of the great divisions or epochs of geological history,—the primary, or "Azoic" and "Palæozoic," and the Tertiary, or "Kainozoic."

More than ten years ago Professor McCoy expressed an opinion, on evidence derived from the examination of certain fossil plants that had then been found associated with the coal-bearing strata of New South Wales,—that rocks of the Mesozoic or secondary epoch were not, as had previously been supposed, entirely absent in Australia. This opinion is now proved to have been well founded. Recent discoveries show that most if not all the coal-bearing rocks in Victoria may certainly be referred to that epoch. Associated with the aqueous stratified rocks of each epoch, there are a great variety of igneous rocks, including granitic, trappean, and volcanic.

In Victoria, as elsewhere, it has been found impossible to draw any marked line of separation between these different classes of igneous rocks.

There is frequently a gradual passage from the granitic to the trappean, and from the trappean to the volcanic forms. Generally, however, it may be said that granitic and trappean rocks are

more or less characteristic of the primary and secondary epochs, whilst those that are clearly of volcanic origin belong, for the most part, to the tertiary epoch. Numerous elvan dykes traverse the lower palæozoic strata that do not pass into the upper palæozoic or mesozoic beds immediately resting on them;—and as the conglomerates of the latter are partly formed of pebbles derived from the dykes, as well as from the soft graptolite slates amongst which they have been intruded, they—the dykes—are clearly proved to have been erupted antecedent to the denudation of the lower palæozoic strata and to the commencing of the upper palæozoic period.

Instances of this are well exhibited in the sections of the junction of the two formations in the gorge of the Werribee, near Bacchus Marsh. Photographs Nos. 18 and 20.

The shales in contact with these elvans do not appear to have been metamorphosed, but are much impregnated with iron alum, that effloresces on the exposed surfaces in great abundance. Specimens Nos. 41 *a* and 41 *b* are from these dykes, and specimens Nos. 47, 48, 49, and 51 are from dykes associated with the upper palæozoic sandstones of the Grampians.

In the primary and tertiary stratified formations, representatives of several of the European groups or subdivisions have already been recognized, and further investigation will probably disclose the presence of other of the links at present wanting in the series. Those that have been identified and carefully examined contain an assemblage of organic remains, presenting forms of which some species and many genera are identical with those found in the equivalent groups in other countries. They also occupy the same relative geological position, and exhibit a most striking general resemblance in lithological character and mineral constituents.

Thus, in general structure and composition, in geological sequence, and in physical and palæontological relations, the rock formations in Victoria are in all respects analogous to those of other regions. As it is not desirable in a sketch of this nature to enter into any detailed geological descriptions or theoretical deductions, it will be confined to a brief notice of the most important and characteristic features of the rocks of each period, which, with the aid of the geological plans, photographs, drawings, and specimens exhibited, will, it is hoped, convey an intelligible idea of the leading features of the geology of Victoria.

I.—PRIMARY, OR PALÆOZOIC ROCKS.

Under this general term we may, in this sketch, conveniently include all rocks below the triassic period. Whether there are any rocks in Victoria older than those of the lower Silurian period is at present uncertain. Proceeding westward from the meridian of Melbourne, a gradually descending series is met with, and towards the extreme limits of the colony, west of the Grampians, a group of strata are exposed, in very limited patches only, consisting of foliated micaceous, chloritic talcose, and serpentinous schists, with irregular masses of hard brown quartzite and numerous thin interlaminated bands of white quartz. These may possibly be representative of a true Cambrian or Azoic series. No gold has yet been found associated with these rocks, or, indeed, in any portion of the country west of the meridian of the main chain of the Grampians.

Lower Palæozoic Rocks.—Silurian.

So far as at present known, the rocks of this period are the source whence the whole of the gold now produced in Victoria has originally been derived. They are exposed on the surface at intervals from the Grampians on the west, to the extreme limits of the colony on the east. With a few local exceptions, they have a nearly true meridional strike or direction. Their great longitudinal extent is due to the crumpling and folding to which they have been subjected, causing the same beds to recur again and again at the surface, in a succession of great synclinal and anticlinal undulations. Making due allowance for this repetition of the same beds at the surface, the total vertical thickness of the series is, probably, not less than 35,000 feet.

The lower members of the group consist chiefly of schistose and slaty rocks, with numerous beds of hard gritty quartzose and soft micaceous sandstones. Among the latter are beds that afford good freestone for building purposes, and in the former, flags and roofing slates are occasionally met with.

Various species of *Polyzoa* are the characteristic and most abundant fossils that have been found in the lower beds. Specimens and figures of these are exhibited in Class IV.

In the upper portion of the series, which does not extend more

than a few miles westward of the meridian of Melbourne, shaly "mudstones," associated with sandstones, very varied in color and texture, are most prevalent. This portion is seldom affected by the true slaty cleavage, so characteristic of the lower beds, and it contains a rich assemblage of fossil animals indicative of several of the subdivisions of the upper Silurian period. The almost total absence of limestone bands, the number and extent of the quartz veins, and the constantly recurring protusions at short intervals of granitic, and occasionally of other plutonic trappean rocks, in dykes and large masses, are the most remarkable features in the physical structure of the lower Palæozoic rocks in Victoria. The granitic intrusions do not occur along any main axes of elevation, but are dotted about over every part of the area within which the Palæozoic rocks are found. The stratified rocks amongst which they have been intruded are invariably hardened and otherwise metamorposed for a short distance from their junction. This alteration varies in a very marked degree with the mineral character or the altering mass—thus the change produced by Diorites and Feldspar Porphyries is often very distinct from that produced by Granite. Their intrusion appears very rarely, if ever, to have exercised any influence in determining the general strike, dip, and contortions of the Palæozoic rocks:—these invariably retain their general meridional direction, which is certainly remarkable, considering that the main water-shed or axis of elevation runs from east to west, and consequently nearly at right angles to the strike of all the older rocks. It is difficult, under these circumstances, to understand what influence can have determined this feature in the physical geography of Victoria. That no great alteration, or even modification of the water-shed, has taken place since the earliest tertiary periods is well proved by circumstances connected with the physical geology of the formations of that period, as exhibited on either side of the dividing range.

The quartz veins occur throughout the lower Palæozoic rocks, from the size of a thread to many feet in thickness. They have mostly a nearly true meridional direction, and are inclined either east or west, at angles varying from horizontal to vertical; occasionally they occur between the planes of the strata—more frequently in those of cleavage, and often they intersect both. They are true mineral lodes, and perfectly analagous in their mode of occurrence to all other mineral veins, whether of silver, lead, tin, copper,

or any other crystalline mineral. No better illustration of the number and importance of these veins could be given than is furnished by the quarter-sheet maps of the geological survey of the Castlemaine and Fryerstown districts, on which the physical features have been very elaborately drawn, and every "reef" and "gully" laid down, whether known to contain gold or not.

The thickest and most persistent veins are found in the lower or older portions of the series, but the average yield of gold per ton is, however, greater from the generally thinner veins of the upper beds. These occur at Kilmore, Yea, Reedy Creek, Heathcote, and Rushworth gold fields.

The greatest depth to which any reef has yet been worked is about 460 feet. At this depth a yield of over 5 ozs. per ton has been obtained.

The total area occupied in Victoria by lower Palæozoic formations with their associated plutonic rocks, inclusive of tracts in which the overlying tertiary deposits do not exceed 300 feet, cannot be estimated at less than 30,000 square miles. Deducting 10,000 square miles occupied by granitic and other rocks that are not, or only partially auriferous, we have an area equal to 20,000 square miles, in any part of which there is a possibility of remunerative gold deposits being found either in quartz veins or in the alluvial deposits derived from them. It is hardly necessary to add that the area that is ever likely to be actually dug over or mined upon, must of course be only a small proportion of that occupied as above stated by gold-bearing rocks. No part of Gipps Land is included in the above estimate. Gold deposits are now known to occur there over very extensive tracts, but the geology of the district has not yet been investigated.

These facts, taken in connection with the large extent of country over which gold-bearing quartz veins have been discovered, the small number that have ever yet been worked in any one district, and the insignificant depths to which in most cases the workings have been carried, afford good grounds for the inference that the gold mines of Victoria may, with the requisite combination of capital and judicious working, be made as permanent a source of wealth as the tin, copper, and lead mines of Great Britain.

Besides gold, many other metallic minerals are found in Victoria, either associated with the quartz reefs or in other formations; but with the exception of stream tin, sulphurets and oxides of antimony

and hydrous oxydes and other ores of iron, none have yet been found in workable quantity.

Several small diamonds have been exhibited in Melbourne said to have been found on the Ovens gold fields, but the statements respecting them are not very reliable, and they are consequently marked as doubtful in the annexed list of

MINERALS FOUND IN VICTORIA.†

Those marked thus (*) have alone been found in sufficient quantity to be commercially valuable.

Name.	Locality.
1. Gold (native) in crystals, &c.*	Lower Palæozoic and Tertiary formations.
2. Gold alloyed with silver*	
3. Silver. chloro bromide ...	Quartz reefs, St. Arnaud.
4. Tin, cassiderite (*oxyd of tin*)* ...	Ovens, Taradale, Strathbogie, Upper Yarra, &c., as stream tin only, associated with the gold drifts.
5. Copper, native	Specimen Gully, Castlemaine.
6. Ditto, blue carbonate (*azurite*)...	Steiglitz, Pyreeth Creek.
7. Ditto, green carbonate (*malachite*)	Steiglitz, Castlemaine, Bendigo, &c.
8. Ditto, red oxyd	Steiglitz.
9. Ditto, pyrites	Steiglitz, Castlemaine, Bendigo, &c.
10. Ditto, indigo (*covelline*) ...	Steiglitz, Castlemaine, Bendigo, &c.
11. Ditto, glance (*sulphuret of copper*)	Steiglitz, Castlemaine, Bendigo, &c.
12. Lead, sulphuret (*galena*) ...	Seiglitz, Bendigo, Castlemaine, Maryborough, and other gold fields, associated with quartz reefs.
13. Ditto, carbonate (*cerusite*)	Nicholson Gully, Castlemaine.
14. Ditto, phosphate (*pyromorphite*)	
15. Ditto (*cuproplumbite*), lead, copper, and sulphur	McIvor.
16. Antimony, sulphuret (*antimony glance*)	Heathcote, Templestowe, Upper Yarra, Maryborough.
17. Antimony, ochre (*stiblite*) ...	Ditto, ditto.
18. Zinc, sulphuret (*blende*) ...	Specimen Gully, Castlemaine, Russell's Reef, near Malmsbury.
19. Manganese, binoxyd (*pyrolusite*)	Indented Heads.
20. Ditto, iron manganese, with traces of copper and cobalt, occur in several quartz reefs	Castlemaine, Dunolly, &c.
21. Bismuth, carbonate (*bismutite*)	
22. Iron, native meteoric	Cranbourne.
23. Ditto, sulphuret, pyrites, mundic	Generally distributed.
24. Ditto, ditto, auriferous ...	
25. Ditto, marcasite, white iron pyrites	
26. Ditto, arsenical pyrites, mispickel	

† Since writing the above I have obtained additional evidence of such a character as entirely to remove any doubt that may have existed relative to the occurrence of diamonds in Victoria.

MINERALS FOUND IN VICTORIA—*continued.*

Name.	Locality.
27. Ditto, peroxyd (*specular iron*) ...	Grampians.
Ditto, ochre, red iron foam* Ditto, brown iron ore, clay iron ore*	Generally distributed { Chiefly in Tertiary rocks.
28. Ditto, titaniferous iron sand (*iserine*)	Generally distributed.
29. Ditto, magnetic (*magnetite*) ...	Generally distributed.
30. Ditto, chromic	Heathcote.
31. Ditto, peroxyd (*limonite*) ...	Lake Connewarre.
32. Ditto, tungstate ?	
33. Ditto, arseniate (*scorodite*) ...	Tarrengower, Maryborough.
34. Ditto, phosphate (*vivianite*)	
35. Ditto, carbonate (*sphærosiderite, clay iron ore*)	{ Nodules and coatings of cavities in basalt. Associated with coal rocks.
36. Ditto, cube ore (*pharmakosiderit*)	Tarrengower, Castlemaine, Bendigo, Maryborough.
37. Diamonds ? not fully verified ...	Ovens gold fields.
38. Graphite	Ditto.
39. Lignite, coal	Tertiary and secondary rocks.
40. Sapphire, blue, green, and red, or oriental ruby	Gold drifts, various gold fields.
41. Spinel ruby	Ditto, ditto.
42. Zircon	Ditto, ditto, fine crystals from Daylesford.
43. Topaz, various colors, white, blue, &c.	Ditto, ditto.
44. Tourmaline	Common in the granites of many districts. and in the gold drifts
45. Hornblende	Occasionally in granite, and near Lancefield, Melvor, &c.
46 Augite: 1. Cocolite	In basaltic rocks.
47. Chlorite	In quartz reefs, Castlemaine, and various localities.
48. Olivine	In basaltic rocks, various localities.
49. Rubellan	In basalt near Footscray.
50. Mica	Various localities, Glenelg, near Harrow.
51. Feldspar: 1. Orthoclase; 2. Albite; 3. Oligoclase; 4. Labrodorite	1–3. Kyneton; 1. Amherst; 3. Mount Alexander; frequent in basalt of points of eruption.
52. Kaolin*	Govett's station, Bulla, &c.
53. Agalmatolite; hydrous silicate of alumina	Nodules in basalt, Keilor Plains.
54. Steatite and several other amorphous silicates of alumina and magnesia occur frequently	In the basaltic rocks, also in fissures, quartz reefs, and silurian rocks; steatite occurs as pseudomorphs in quartz near Strathloddon.
55. Zeolites:—	
1. Analcime...	Phillip Island.
2. Natrolite (*scoleite?*) ...	Ditto.
3. Chabasite	Basalt, near Clunes.
4. Ledererite	Ditto, near Richmond.
5. Gmelinite	Ditto.

MINERALS FOUND IN VICTORIA—*continued.*

Name.	Locality.
56 Lime carbonate (*calc spar*) ...	Generally distributed.
Limestone	Chiefly in the tertiary formations.
57. Arragonite	In basalt and gold drifts, very common.
58. Lime, sulphate (*selenite, gypsum*)	In swamps and older tertiary rocks.
59. Magnesia, carbonate	In the freestones of Bacchus Marsh, Western Port, &c.
60. Sodium, chloride*	
61. Alumina, sulphate (iron alum)...	In freestones of oolitic coal rocks.
62. Alunite (alum stone)	In nodules in basalt, near Gisborne.
63. Quartz:	
1. Rock crystal	On all the gold fields.
2. Cairngorm (smoky quartz)...	Ovens, Tarrangower, &c.
3. Prase (green quartz) ...	Lady Gully Reef, Castlemaine, Heathcote, &c.
4. Chalcedony	In basalt, Sunbury, Keilor, &c.
5. Agate.	
64. Opal:	
1. Hyalite	In cavities of basalt, various localities.
2. Opal jaspar	In basalt, near Melbourne, Riddell's Creek.
3. Opalised wood	Bass River, Western Port, Grampians.
4. Semi opal	In basalt, near Melbourne.
5. Chloropal	In basalt, Deep Creek, Mount Bullangarook.

UPPER PALÆOZOIC ROCKS.*

At Bacchus Marsh, situated about twenty-five miles west of Melbourne; at Ballan, in the Grampian and Serra or Victoria ranges; on the eastern part of the Mount Macedon ranges; on the Coliban, near Kyneton; on the Wild Duck Creek, near Heathcote; on the Goulburn, near Mansfield, and in various parts of Gipps Land, rocks occur that are probably referable to periods intermediate between the Carboniferous and the Permean. Much careful and critical examination and comparison will, however, be requisite in all the abovenamed localities before the exact geological position and relations of these rocks can be definitely determined. The only fossils that have been found in them are—from Bacchus Marsh, *Cyclopteris;* from Mansfield, *Knorria;* and from Gipps Land, *Lepidodendron* (Photograph No. 30), the latter being a characteristic plant of the Carboniferous or Palæozoic Coal period.

* The classification of these as Upper Palæozoic is only provisional; they may be Lower Mesozoic.

Photographs (Nos. 6–10 and 30) by Mr. Daintree, of the Victorian Geological Survey, are taken from the Bacchus Marsh and Gipps Land specimens.

In the Grampians and the Serra or Victoria ranges, these beds show a thickness of upwards of two thousand feet exposed in the precipitous escarpments of Mount Sturgeon, Mount Abrupt, and the eastern face of the Victoria Range. Their prevailing character is that of massive thick bedded sandstone, varying in texture and composition from very hard silicious grit and quartz rock with included pebbles of white quartz, as at Mount Talbot, Mount Arapiles, and the Black Range, to hard and soft fine-grained freestones.—(Specimens Nos. 182, 183, 186, 187, and 188.)

At Mount Sturgeon several quarries have been opened, from which freestone of excellent quality can be obtained in unlimited quantity. At present the cost of transport from such a remote inland district prevents its being used in Melbourne, although, in many respects, it is perhaps the best freestone found in Victoria.

Several other localities, also, where similar Upper Palæozoic rocks occur, have afforded good freestones. In the neighborhood of Bacchus Marsh they are extensively quarried, and have been used in the construction of several of the largest public buildings in Melbourne, as the Custom-house, the Treasury, and the Parliament Library.

Specimens of the stone and photographic views of the quarries are exhibited in Class IV. Photographs No. 17 and 39.

In several of the localities enumerated, thick masses of conglomerate are associated with the sandstones. They occur generally towards the base of the series, and are composed of a very irregular aggregation of rounded pebbles, and occasionally angular fragments of all sizes of granite, green stone, various porphyries, hard slate, gritty sandstone, grey quartz rock and quartz. These pebbles and fragments are imbedded either in a soft, almost earthy mass, showing little or no trace of stratification, as at Darley, near Bacchus Marsh, or are interspersed in a thinly stratified sandy shale, as at the point where the road from Sandhurst to Lancefield crosses the Wild Duck Creek. They also sometimes occur in hard cemented masses, as on the Mount Macedon ranges. The character of these beds in some of the localities named, is such as almost to preclude the supposition of their being the result of aqueous transport and deposition only. It is, however, very suggestive of the results

likely to be produced by marine glacial transport, and the mixture of coarse and fine material, both waterworn and angular, much of which has clearly been derived from remote localities, would also favor this supposition.

In the Grampians the sandstones have a general westerly dip at rather low angles, giving a gentle slope to the face of the hills in that direction, whilst to the eastward the beds are abruptly cut off and terminate in bold rocky escarpments and vertical cliffs several hundred feet in height. In many places in the western district the beds are seen to rest directly on granite, whilst in others they rest on the upturned edges of the Silurian strata, as shown in the photograph (No. 20) of portion of a section on the Werribee River, near Bacchus Marsh, in which the junction of two formations is well exhibited. Numerous small detatched patches or outliers attest the former extension of these upper Palœozoic rocks over a very large area in the central districts of Victoria.

No minerals of economic value have been found in them, nor do they present indications of mineral veins of any kind. The cupriferous, calcareous, and slaty strata of South Australia are, however, probably the lower members of the same group, but these have not yet been recognized in Victoria.

Whether any gold occurs in them, derived from the auriferous Silurian strata on which they have been deposited, is a very interesting question connected with the determination of the probabable period at which the quartz veins were impregnated with gold. The pre-existence and partial denudation of a quartz vein is very distinctly shewn in the section above mentioned. View No 20. Locally the beds are often much impregnated with sulphates of magnesia, alumina, and alkaline chlorides, which, by causing rapid exfoliation and decay, greatly deteriorate the quality and value of the otherwise very excellent building-stone procured from them.

II.—SECONDARY OR MESOZOIC EPOCH.

As before stated, nearly all the coal-bearing rocks in Victoria may probably be referred to this epoch.

They have been recognized in several districts over large areas—Cape Patterson and Western Port, the Cape Otway ranges, the

Barrabool Hills, Geelong, and the shores of Port Phillip Bay, in Gipps Land, and in the valley of the Wannon.

In most of the districts named seams of good bituminous coal have been found. The best and indeed the only ones, that could be profitably worked, except for local use, when firewood has become much more costly than it is at present, are situated on the coast at Cape Patterson, about midway between Port Phillip Heads and Wilson's Promontory.

At intervals, since the first discovery of these seams by Messrs. Hovell and Hume, in 1828, considerable sums of money have been expended, both by the Government and through private enterprise in endeavors to develop them. Numerous shafts and bores, none exceeding three hundred feet deep, have been made in the neighborhood, and a great part of the district has been geologically examined. These investigations whilst proving that a very extensive tract of country is occupied by the coal-bearing formation, in all parts of which thin seams and streaks of coal constantly occur, have however, unfortunately, hitherto not only failed to elicit any facts disproving what had been intimated respecting this field when first examined in 1853; but have on the contrary, strongly confirmed the opinion then expressed, which was to the effect, that if thick and extensive seams occurred in the district they would have to be sought by deep sinking, into those portions of the formation that were not exposed at the surface, the seams that were exposed being evidently very limited in extent, and very variable in thickness.

Notwithstanding these somewhat unfavorable circumstances, there is no doubt that, with the gradual diminution in the price of labor and other favoring conditions the time is rapidly approaching when a very considerable quantity of good coal will be profitably raised from the Cape Patterson seams. The reason that it has not yet been done is solely due to circumstances of position, and consequent cost of production, which have combined to render it hitherto impossible to compete with the coal fields of New South Wales. It is estimated that about one hundred thousand tons could be raised from the seams that have been proved in the land leased by the Government to the Cape Patterson Coal Company. Up to the end of last year (1860) this company had expended more than £3000 without any return whatever; and during the last ten or twelve years, probably, more than double that amount

has been expended in the district, while about one hundred tons of coal is all that has been brought to market.

Geological investigation during the past year has proved that coal-bearing strata similar to those at Cape Patterson occur either at the surface, or thinly overlaid by the newer tertiary rocks, in uninterrupted continuity, over a tract of country about one hundred miles long, and nowhere much less than twenty miles wide, extending from the Gellibrand River west of Cape Otway, to the south-east coast of Port Phillip Bay; including the Indented Heads Promontory, Geelong, and the Barrabool Hills. Thus there is here an area of about two thousand square miles in almost any part of which it is not improbable that workable coal seams may be discovered. Shafts and borings of an aggregate depth of nearly three thousand feet have been made during the past year on the Indented Heads Promontory for the purpose of testing some of these strata. The deepest shaft is two hundred and twenty-five feet, and the deepest boring five hundred feet. In these a total vertical thickness of two thousand feet of strata has been sunk through in which there are no workable seams of coal. Some thin seams of impure coal were met with, and in the shales numerous specimens of fossil plants were found, some of which are specifically identical with those that are found in the strata associated with the coal seams of Newcastle, in New South Wales. Others (species of *Zamites* and *Tæniopteris*) that have not previously been discovered in any of the Australian coal rocks are characteristic genera of the Mesozoic epoch in other countries.—Photographs, Nos. 6 to 16, taken from some of the specimens, and figures of others are exhibited in class VI. Except in the valley of the Wannon no traces have yet been found in these beds in Victoria of fossil animals. Several specimens of a new species of *Unio* were found last year whilst sinking for coal in that district. They were embedded in a soft greenish grey sandstone, overlying some thin seams of carbonaceous matter more resembling lignite than true coal. This fossil has been named *Unio Dacombii* by Professor McCoy. He considers it to be totally distinct in its generic characters from the so-called *Unio* of the Palæozonic coal beds, and truly to accord with the recent type of *Unio;* thus being clearly indicative of a period not older than some stage of the secondary epoch. These discoveries taken in conjunction with other evidence strongly confirm the opinion that some at least of

the Australian coal rocks belong to the secondary or Mesozoic epoch.

A great similarity in general lithological and mineral character obtains throughout these rock in Victoria. Alternating thick masses of hard and soft sandstones and argillaceous shales occur throughout the series, but the absence from it of any marked and distinctive groups of beds renders their co-ordination in distant localities a task that will yet require a vast amount of very critical examination and comparison.

The prevailing color of the strata, especially of the sandy beds, is a dull greenish grey, occasionally passing into brown. The shales are commonly dark grey, blue, or almost black, the latter frequently containing a good deal of sulphuret of iron. Thin streaks of bright jet coal and obscure impressions of plant remains are found throughout both sandstones and shales. Occasionally portions of large branches or trunks of trees are met with horizontally embedded. Calc spar occurs either in veins or forming a thin coating on the faces of the joints, and concretionary nodules of clay iron stone (Carbonate of Iron) are also frequently met with, but not in sufficient quantity to be remuneratively extracted.

In the vicinity of Geelong the sandstones are extensively quarried, and have been used in constructing nearly all the largest buildings, both public and private, in that city. The English, Scottish, and Australian Chartered Bank, in Elizabeth-street, Melbourne, is also built of freestone from this formation, quarried near Griffith's Point, on the east side of Western Port Bay. Like the freestones of the Bacchus Marsh series these also are found to be locally much impregnated with saline matter, that, on exposure to the atmosphere, effloresces on the surface of the stone causing exfoliation and decay.

The character of the strata generally indicates that they have been deposited in comparatively shallow waters, and subjected during their deposition to the action of strong and constantly varying currents, giving rise to much diagonal or wedge-shaped stratification.

The associated coal seams also partake of this character, and a careful examination shows that the vegetable matter from which they have been formed has been entirely accumulated by aqueous drift action. This physical condition of their accumulation is

probably in a great measure the cause of their so often rapidly thinning out or splitting up into thin layers in their horizontal extension, and seldom presenting that more or less permanent thickness over large areas, that is found to obtain in the Palœozoic coal seams of Europe, where the vegetable matter has grown either entirely or in great part on the spot where it is now entombed.

The total thickness of the series in Victoria probably varies considerably in each district, where best developed there are certainly not much less than three thousand vertical feet of strata, after making due allowance for repetitions of the same beds at the surface through dislocations and other causes. The physical character of the district in which they occur is very varied; in some there are densely timbered and precipitous hills and valleys, see Photograph No. 19; in others fine undulating downs, clothed with rich grass and scarcely any timber, or low flat country covered with coarse grass, with scrub, grass trees, and stunted gums. This latter character is, however, chiefly due to the presence of overlying tertiary deposits that commonly form a poor sandy soil. Where they are not so overlaid the soils accompanying them are exceedingly fertile, as in the Barrabool Hills, in the valley of the Wannon, and in parts of the Western Port and Cape Otway ranges.

III.—TERTIARY OR CAINOZOIC EPOCH.

The Recent or Human Period.

The rocks of this epoch, whether regarded in their industrial, in their geological, or in their physical aspects, must be held to occupy the most prominent position in Victorian geological history.

Strata referable to one or other of the periods of this epoch, occupy probably fully two-thirds or sixty thousand square miles of the surface of Victoria. They are found resting on all the older rocks both igneous and stratified, and extending in their upper members from the sea level to elevations of fifteen hundred or two thousand feet. They include groups of strata consisting of

sand, clay, limestone, gravel, and conglomerate, each of which has its distinctive palæontological, mineral, and geological characters, indicating them to be truly representative of the Eocene, Miocene, Pliocene, and Pleistocene deposits of Europe and other countries.

The igneous rocks associated with them are strictly volcanic, and in no instance do they appear to be of older date than the close of the Miocene period. Their greatest development has taken place during the deposition of the Pliocene series, and in some instances it has evidently been continued to a period that could not be chronologically separated from the most recent geological events.

The exact period in the tertiary epoch when the gold drifts commenced is at present exceedingly doubtful. No beds are yet known in Victoria, associated with or forming a portion of such drifts, that contain fossil marine animals. Neither has any gold been obtained from beds below the known fossiliferous tertiary strata. The volcanic rocks consisting chiefly of varieties of Trachytic Dolerites, Basalts, Trachytic Porphyries, &c., are in many districts interstratified in contemporaneous layers with the sands, clays, and gravels, of what are at present considered to be the oldest gold drifts, in which the lowest stratum where the gold occurs almost invariably consists of a very much waterworn quartz gravel. That there are gold drifts, marking at least three distinct deposits, the result of successive upheavals and depressions is quite certain,—and it is now almost equally certain that the earliest of them was the result of the commencement of the oldest Pliocene period. In accordance with this view they have been divided into Older Pliocene, Newer Pliocene, and Post Pliocene deposits (*vide* Geological Maps). These three stages sometimes occur in the same locality, without the intervention of any volcanic rocks, in which case three bottoms or gold-bearing strata are found in one shaft, the last being always on the solid unmoved Palæozoic rock. About four hundred feet is the greatest known thickness of these older Pliocene deposits, including the associated volcanic rocks; and at this depth rich deposits of gold are found in them, resting on the slopes and in the hollows of what was once the old Pliocene sea bed. The exact relations of the gold bearing drifts of the upper Tertiary periods to the marine Tertiary sands, clays, and limestones of the Miocene and Eocene series, is a very interesting point in Victorian geology not yet elucidated, and one

which may have an important bearing on the probable extension of the deep gold leads of Ballaarat and other gold fields.

In following the leads, they are invariably found to deepen in the general direction of the existing surface water-shed. Thus at Ballaarat and other gold fields on the south side of the dividing range, they deepen in a southerly direction, whilst at Clunes, Bendigo, &c., they invariably deepen in the opposite or northerly direction; and there seems no reason why they should not extend underneath a very large part of the extensive plains that stretch from the northern gold fields to the Murray, and from the southern flank of the dividing range to the sea board, wherever the tertiary rocks, forming these plains, rest directly on the lower Palæozoic strata.

Excepting over comparatively limited areas on the upper branches of the Campaspe, the Loddon, and the Coliban, the tertiary volcanic rocks are apparently exclusively confined to the south-western portions of Victoria. From near Mount Gambier, in South Australia, the volcanic action appears to have extended in a north-easterly direction, gradually increasing in width and intensity to near the meridian of Ballaarat, from whence it appears again to have slowly decreased, and to have almost entirely died out before reaching the valley of the Goulburn.

The mammaloid and conical hills that occur at intervals throughout this volcanic region constitute the most marked and characteristic features in its physical aspect. Apparently they have all been points of eruption; on many of them the outline of the ancient crater is still quite perfect. In some there are deep lakes, whilst others are quite dry, and the whole cavity is thickly timbered, and clothed with luxuriant vegetation. On nearly all there are either volcanic scoriæ or tuffs and ash beds, from which it may be inferred that many of them were probably subærial volcanic vents that formed low islands in the Pliocene tertiary waters.

Those in which the cavity of the crater is still most perfect are generally those that present indications of having been most recently active.

The number and extent of the salt and fresh water lakes and pools, is also a somewhat remarkable feature of the tertiary district in Victoria. In examining these it is almost invariably found that in such as have a permanent outlet the waters are either quite fresh or only very slightly brackish, whilst in those that have no outlet they are commonly salt. Many of them are very shallow,

and toward the close of a dry summer the water has entirely evaporated and left a deposit of crystallized salt, a few inches thick, resting on black mud. The salt is sometimes collected in considerable quantities, for local use, by the settlers in the neighborhood. There are no salt springs in the district, and it seems probable that the sites of these lakes are depressions in the surface, from which the sea water could only escape by evaporation after the last upheaval of the land. Thus the original amount of saline matter is retained in them, and deposited by evaporation during the summer months, only to be re-dissolved by the winter rains. On the other hand, where a permanent outlet exists, each accession of fresh water carries off its proportion of saline matter, until the whole has been removed. An excellent and very durable building stone, known locally as "bluestone," is obtained from the tertiary volcanic strata. It is commonly used for building and roadmaking in all the volcanic districts; is very easily worked and can be procured in blocks of almost any dimensions. It belongs to the true Dolerites or Augitic Lavas. Its mineral composition is generally a granular mixture of Augite, Feldspar (probably Labradorite), with magnetic and titanic Iron, Carbonate of Lime, Spherosiderite and Olivine. It is commonly more or less vesicular and porous, and occasionally very compact and crystalline. A variety of Zeolitic minerals have been found associated with it. Rich Iron Ores (*Hydrous Oxyd*), are very common in the upper Pliocene beds.

Limestone of various kinds, Gypsum, fine Clays for bricks and pottery, beds of Lignite and fossil Resins are also productions of the tertiary rocks in Victoria.

Specimens of most of these are exhibited, as well as others showing the general mineral character of the different rocks of the tertiary epoch.

The soils found on the volcanic rocks are the richest and most fertile in Victoria; and, consequently in all the districts in which they occur settlement and cultivation is rapidly advancing.

I.—A TABULAR RECORD,

SHOWING GENERALLY

THE DATE OF DISCOVERY, IN VICTORIA AND OTHER COUNTRIES,

OF THE

MOST REMARKABLE SPECIMENS OF NATIVE GOLD;

THEIR WEIGHT, AND WHERE PRACTICABLE, THEIR SPECIFIC GRAVITY, ASSAY, AND WEIGHT OF PURE GOLD.

BY WILLIAM BIRKMYRE, Esq.

This Paper is the Property of the Mining Department, and is Published with the consent of the Honorable John Basson Humffray, M.P., Commissioner of Mines.

***** Where the Asterisk occurs, it denotes that the Nuggets or Specimens have been Assayed by the Author.**

—	Date of Discovery.	Gross Weight (Troy).		Specific Gravity.	Assay.			Estimate Weight of pure Gold.
					Gold per cent.	Carats.	Car. grs.	
1. "The Welcome Nugget," found by a party of 24 at Bakery Hill, Ballaarat, Victoria, at a depth of 180 feet, apparently water-worn, and of no regular shape, its length being 20 inches, breadth 12, depth 7, containing about 10 lbs. of quartz, clay, and oxide of iron. Previous to finding this great nugget the same party met with some smaller ones weighing from 12 to 45 ozs. It was first sold in Ballaarat, in 1858, for £10,500. After being exhibited for many weeks in Melbourne it was sold there on the 18th March, 1859; it then weighed 2,195 ozs., and fetched £9,325, or £4 4s. 11d. per oz. Melted in **London, Nov., 1859** (*)	15th June, 1858	lb. oz. dwt. 184 9 16 or, in avoirdupois weight, 1 cwt. 1 qr. 12 lb.	oz. dwt. 2,217 16	...	99·20	23	3⅛	oz. dwt. gr.

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I.—Most Remarkable Specimens of Native Gold—*continued.*

—	Date of Discovery.	Gross Weight (Troy).		Specific Gravity.	Assay.			Estimate Weight of pure Gold.
					Gold per cent.	Carats.	Car. grs.	
		lb. oz. dwt.	oz. dwt.					oz. dwt. gr.
2. "The Blanche Barkly," found by a party of four, quite by itself, at Kingower, Victoria, at a depth of 13 feet, and within 5 or 6 feet of holes dug three years before. It measures 28 inches in length, and 10 inches in its widest part, and apparently contains 2 lbs. of quartz, clay, and oxide of iron. Melted in London, 4th August, 1858. Value, £6,905 12s. 9d. This nugget, previous to melting, was exhibited in Melbourne, and at the Crystal Palace, Sydenham, London, where it was an object of great interest, from its bulk, brightness, and solidity, the returns to the fortunate owners for some time being £50 per week (*)	27th Aug., 1857	145 3 13	1,743 13	...	95·58	22	$3\frac{5}{8}$	
3. Found at Canadian Gully, Ballaarat, Victoria, by a party of four, at a depth of 60 feet, and immediately after, a smaller one, weighing 76 oz. Two of the party had not been longer in the colony than three months, when they returned to England with their prize in the steamer *Sarah Sands*. This specimen, although large, was not very attractive, for both the gold and the quartz were dark colored. Melted in London in 1853. Weight before melting, 1,615 oz. 10 dwt.; after,	31st Jan., 1853	134 11 0	1,619 0					

1,319 oz. 1 dwt. 12 gr. of fiue gold, of 98·96 per cent. of pure gold, equal to 1,423 oz. standard gold; value at £3 17s. 9d. per oz., £5,532 7s. 4d., the loss in weight in melting being 296 oz. 8½ dwts=18·6 per ceut.							
4. Found by a native boy amongst a heap of quartz, ou the surface of the ground at Meroo Creek, River Turon, 53 miles from Bathurst, N.S.W. It was iu three pieces when discovered, though generally considered as oue mass. The aboriginal who discovered these blocks observed "a speck of some glittering substance upon the surface of a block of the quartz, upon which he applied his tomahawk and broke off a portion." One of the pieces weighed 70 lb. avoirdupois, and gave 60 lb. troy of gold; the gross weight of the other two about 60 lb. each. These three pieces, weighing 1¾ cwt., coutained 106 lb. troy of gold, and about 1 cwt. of quartz. In the same year another nugget, No. 39, weighing 30 lb. 6 oz., was discovered in clay, 24 yards from the large pieces; aud in the following year, also uear to No. 4, there were found two nuggets, weighing 157 oz. aud 71 oz.	July, 1851	106 0 0	1,272 0[1]				
5 and 6. Found at Dunolly, Victoria, two specimens, with gold distributed through a rust-colored matrix. Melted iu Melbourne, October, 1857, the produce being 1,363 oz. 18 dwt. of gold. Value about £5,500	1857	237 0 0	2,952 0				
7. Found by a party of four, at Burrandong, near Orange, N.S.W., at a depth of 35 feet; wheu pounded with a hammer, it yielded 120 lb. of gold, for which £5000 were offered. Melted at the	1st Nov., 1858	107 2 8	1,286 8	...	87·40	20 3⅛	

[1] Weight of crushed gold.

I.—Most Remarkable Specimens of Native Gold—*continued.*

—	Date of Discovery.	Gross Weight (Troy).		Specific Gravity.	Assay.			Estimate Weight of pure Gold.
					Gold per cent.	Carats.	Car. grs.	
		lb. oz. dwt.	oz. dwt.					oz. dwt. gr.
Sydney Mint, when it weighed 1,286 oz. 8 dwt ; after melting, 1182 oz. 7 dwt. ; loss, 8 per cent. ; fineness, 87·4 per cent., the standard weight of gold being 1,127 oz. 6 dwt. Value, £4,389 8s. 10d. The gold was mixed with quartz and sulphuret of iron (mundic)								
8. "The Lady Hotham Nngget," fonnd near Canadian Gully, Ballaarat, Victoria, at a depth of 135 feet. It contains mnch qnartz and sulphuret of iron, bnt is a fine specimen. From the same hole, there were obtained upwards of 220 lb., in smaller nnggets. The value of gold, therefore, from this claim, was not less than £13,000 (*)	8th Sept., 1854	98 1 17	1,177 17	6·093	...	...		755 0 0
9. Found at Miask, Ural Mountains, Russia, at a depth of 9 feet ; weight, 87 lbs. 92 zolotniks, Russian (Tegoborski) 36 025 kilogrammes (Humboldt). In bulk it is almost exactly half of an imperial gallon =138 cnbic inches. Its supposed value, at 22 carats (British Standard), containing 8·33 per cent. alloy, is £4,508 19s. 3d. Preserved in the Museum of Mining Engineers, at St. Petersburg.	Tegoborski 7th Nov., 1842	96 6 2	1,158 2					
10. Found at Canadian Gully, Ballaarat, Victoria, by a party of three, who also obtained No. 12 in the	20th Jan., 1853	93 1 11	1,117 11					

same claim, in a drive at a depth of 60 feet, amongst quartz boulders and washing-stuff, containing an ounce to the tub—its length, 20 inches by 8½, and 5 inches thick. The first blow of the pick led the miner to suspect it had struck gold; with the second, the pick stuck in the mass. The gold is finely intersected with quartz. Estimated value of both No. 10 and 12—£7,500.[1]							
11. Found at Blackman's Lead, Maryborough, Victoria, at a depth of five feet. Sold in Melbourne, in 1855, for £3,250. Melted by me in the same year (*).	June, 1855	86 2 5	1,034 5	8·58	...	...	833 14 0
12. Found at Canadian Gully, Ballaarat, Victoria. This mass was found two days after the discovery of No. 10, in the same claim and tunnel, and within 10 feet of No. 3—length, 12 inches by 6 in breadth, and 6½ inches thick, being somewhat in the shape of a pyramid. This is a very fine specimen, consisting of much gold, with remarkably white quartz. The two working diggers continued at work nearly a fortnight, when they obtained about 100 ounces of small gold—they now sold their claim for 80 guineas.	22nd Jan., 1853	84 3 15	1,011 15				
13. "The Heron Nugget," found by two young men, near Old Golden Point, Fryer's Creek, Mount Alexander, Victoria. A solid lump of gold. They were offered in the district £4000, but refused—(sold in England for £4,080). Besides this mass, they were likewise fortunate in gold-seeking, although only three months in the colony. In the same locality, about three years before, nuggets of 7 lbs. and 22 lbs. were obtained.	29th March, 1855	84 0 0	1,008 0				

[1] This nugget, and No. 12, valued without taking the specific gravity, there being some litigation relative to the division of the property.—W.B.

I.—Most Remarkable Specimens of Native Gold—*continued.*

—	Date of Discovery.	Gross Weight (Troy).		Specific Gravity.	Assay.			Estimate Weight of pure Gold.
					Gold per cent.	Carats.	Car. grs.	
		lb. oz. dwt.	oz. dwt.					oz. dwt. gr.
14. Found at Ballaarat, Victoria, at a depth of 400 feet, a solid lump of gold, and with it 100 ozs. of smaller gold	Aug., 1860	69 6 0	834 0					
15. Found at McIntyre Diggings, near Kingower, Victoria	March, 1857	67 6 0	810 0					
16. Found by two men, at Kingower, Victoria, within a foot of the surface, 18½ inches long, 5½ broad, and an average thickness of 2 inches	1860	67 1 0	805 0					
17. Found at Kingower, Victoria	Feb., 1861	65 2 0	782 0					
18. Found at Daisy Hill, Victoria, at 3½ feet from the surface (*)	22nd Oct., 1855	59 7 0	715 0	7·147	...	...		521 4 0
19. Found near the City of La Paz, situated 12,170 feet above the sea level, on the eastern slope of the Andes in Bolivia, Upper Peru. This nugget weighed 90 Spanish marcs of 3,550½ troy grains per marc=665 troy oz. It varied in composition from 75 to 95·8 per cent. gold	Raynal, 1730	55 5 0	665 0					
20. Found at McIvor, Victoria, at a depth of 16 feet...	Oct., 1858	54 10 0	658 0					
21. Found at Back Creek, Taradale, Victoria, by a party of three, at a depth of 12 feet, a solid lump of gold, and at the same time about 80 oz. in small nuggets. The value of the claim at this depth was nearly £3000	May, 1856	54 0 0	648 0					

22. Found at McIvor, Victoria. Previous to melting, £2,500 were offered for this nugget. It was melted in the Oriental Bank, and lost 11½ per cent =74 oz. 2 dwt.	12th Oct., 1855	53	9	0	645	0				
23. Found in an old hole, at Eureka, Ballaarat, Victoria, smooth and nearly free of quartz. Dimensions, 9 inches long by 7 broad	7th Feb., 1854	52	1	0	625	0				
24. Fouud at Yandoit, Castlemaine, Victoria. Weight, after cleansing, 581 oz. 17 dwt., still containing 6 oz. of quartz; estimated value £2,180 Length, 16 inches; breadth, 10½; thickness varying ¾ to 2 inches. In the same locality, and within six weeks, five more nuggets were found	April, 1860	50	0	0	600	0				
25. Found at White Horse Gully, Bendigo, Victoria, in the same hollow with No. 40 and No. 41. It was partly encrusted with quartz, valued at £2,100	Oct., 1852	47	9	0	573	0				
26. Found at Bakery Hill, Ballaarat, Victoria, at a depth of 185 feet. This nugget and No. 1 were found within 150 yards of each other	6th March, 1855	47	7	0	571	0				
27. The "Nil Desperandum Nugget," found at a rush near the Native Youth, Ballaarat, Victoria, at a depth of 9 feet, with other lumps weighing from 1 oz. to 9 oz. This mass was nearly solid gold, sold in Melbourne, 4th April, 1859—it then weighed 505 oz. Assay, 98·80 per cent. gold=23 carats 2⅞ carat grains; fetched £1,950, or £3 17s. 2¾d. per oz.	Nov., 1857	45	0	0	540	0				
28. Found at Blackman's Lead, Maryborough, Victoria, at a depth of 6 feet	15th Jan., 1858	44	9	5	537	5				
29. Found by an Indian woman, almost on the surface of the alluvium of the River Haina, near to the City of San Domingo, Hayti. This specimen contained some stone (supposed in those days not yet converted into gold), and was said to weigh 3,600	1502	44	4	10	532	10				

I.—Most Remarkable Specimens of Native Gold—*continued.*

—	Date of Discovery.	Gross Weight (Troy).		Specific Gravity.	Assay.			Estimate Weight of pure Gold.
					Gold per cent.	Carats.	Car. grs.	
		lb. oz. dwt.	oz. dwt.					oz. dwt. gr.
castellanos, which, at 71 troy grains per castellano, is equal to 532¼ oz. troy. It was shipped to the King of Spain, as a token of the wealth of Columbus's great discovery, but lost during a storm, with 200,000 castellanos = 29,583 oz. troy of gold								
30. Found in Victoria, by two men, at a depth of 18 feet (*)	1856	43 8 0	524 5	5·99	...	...		335 10 0
31. Found at Bakery Hill, Ballaarat, Victoria, a solid lump of gold in next claim to No. 26 (*)	Mar., 1855	40 0 0	480 0					
32. Found in Reed's Mine, Cabarras County, North Carolina, United States. It weighed 28 lbs. avoirdupois, and was 8½ inches long, 5 broad, and 1 thick; dug up by a negro from within a few inches of the surface	1821	34 6 16	414 16					
33. Found at the Twisted Gum Tree, Ballaarat, Victoria	...	34 0 0	408 0					
34. Found at Kiandra, Snowy River, N.S.W.	Oct., 1860	33 4 0	400 0					
35. Found at Yandoit, Castlemaine, Victoria, at a depth of 16 feet	1860	32 0 0	384 0					
36. Found at Robinson Crusoe Gully, Bendigo, Victoria, in an old pillar of earth of a deserted claim. Length, 12 inches; width, 6 inches; thickness, from ½ to 2 inches	Mar., 1861	31 5 6	377 6					

37. Found in Canadian Gully, Ballaarat, Victoria. It contained a good deal of quartz. Sold in Melbourne, March, 1853, for £1,465 16s. 11d = £3 19s. per oz.	1853	30 11 2	371 2				
38. Fonnd by two diggers in Canadian Gully, Ballaarat, Victoria, at a depth of 60 feet; at the same time another nugget (No. 86), weighing 143 oz. 15 dwt., and both abont 30 feet from No. 3	Feb., 1853	30 8 0	368 0				
39. "The Brenan Nugget," fonnd at Meroo Creek, Turon River, N.S.W., imbedded in clay, measures 21 inches in circumference. It was found 24 yards from No. 4. Sold in Sydney, 1851, for £1,156	1851	30 6 0	366 0				
40. Fonnd by a negro, in the Province of Choco, New Granada, South America. His master presented it to the cabinet of the King of Spain	Humboldt 1793	30 4 11	364 11				
41. "The Victorian Nugget," found in the White Horse Gully, Bendigo, Victoria, close to No. 43. Bonght for presentation to the Queen by the Colonial Legislature, who paid £1,650 = £4 17s. per oz. Its surface was partly encrusted with qnartz and oxide of iron	20th Sept., 1852	28 4 0	340 0				
42. Found at Bendigo, Victoria (*)	1854	28 2 17	338 17	13·09	...	...	314 0 0
43. "The Dascombe Nngget," found at Bendigo, Victoria. Bright, and free from quartz It was found close to No. 41, amongst gravel, about a foot from the surface. Sold in London 5th November, 1852 (it then weighed 330 oz. 15 dwt.) for £1,500, or £4 10s. 8d. per oz. This was the first largest mass of solid gold found in the British Empire	Jan., 1852	27 8 0	332 0				
44. Found at McIvor, Victoria, with smaller gold weighing 35½ oz., of which, nuggets weighing respectively 11½ oz., 11 oz., 6¼ oz., and the wash-dirt remaining would yield 1 oz. gold to the load	1857	27 4 0	328 0				

I.—Most Remarkable Specimens of Native Gold—*continued.*

—	Date of Discovery.	Gross Weight (Troy).							Specific Gravity.	Assay.			Estimate Weight of pure Gold.		
										Gold per cent.	Carats.	Car. grs.			
		lb.	oz.	dwt.	gr.	oz.	dwt.	gr.					oz.	dwt.	gr.
45. Found at MacCallum's Creek, Victoria	...	27	2	10	0	326	10	0							
46. Found at Miask, Ural Monntains, Russia, near to the surface. Weight, 10·117 kilogrammes (15,432·3 grains troy = 1 kilogramme, Prof. Miller, *Phil. Trans.*, 1856)	Hnmboldt 1826	27	1	5	0	325	5	8							
47. Found in the Mines of Eastern Siberia; weight 24 lbs. Russian (6,320 grains troy = 1 lb. Russian)	Tegoborski	26	4	0	0	316	0	0							
48. Found at Baycito, California, at a depth of 54 feet. This was the largest nugget as yet known in California	24th April, 1852	25	5	0	0	305	0	0							
49. Found at the McIntyre Diggings, Victoria, at a depth of 6 feet	Sept., 1858	25	0	0	0	300	0	0							
50. Found at Kingower, Victoria, by two men, in shallow sinking	Ang, 1861	25	0	0	0	300	0	0							
51. Found at Bendigo, Victoria	1852	24	0	0	0	288	0	0							
52. Found at Kingower, Victoria (*)	1854	23	6	2	0	282	2	0	5·25	...	...		162	16	0
53. Found at Evans' Gully, Kingower, Victoria ...	April, 1861	23	5	17	0	281	17	0							
54. Found in Victoria, produced when melted 161 oz. 14 dwt. of gold, containing 97·4 per cent. pure gold	1855	23	5	0	0	281	0	0	5·3	97·4	23	$1\frac{3}{8}$	159	12	19
55. Found at Jones's Creek, Victoria	1856	23	5	0	0	281	0	0							
56. Found at Daisy Hill, Victoria. Sold for £1,019 = 74s. 1d. per oz. (*)	1856	22	1	0	0	275	3	18	14·05	...	...		259	12	12
57. Found at Golden Point, Fryer's Creek, Victoria ...	...	22	0	0	0	264	0	0							

58. Found at Brown's Diggings, Victoria, a fine nugget; sold for £1,022 4s. 6d., or £3 17s. 7d. per oz.	23rd Oct., 1856	21 11 8 0	263 8 0				
59. Found at Kingower, Victoria, within 4 ft. of the surface	May, 1856	21 8 0 0	260 0 0				
60. Found at Mount Korong, Victoria, at $1\frac{1}{2}$ foot below the surface; valued at £1000	May, 1856	12 3 13 0	255 13 0				
61. Found at Gongo Soco, Minas Geraes, Brazil, gold and quartz; raised from the mine of the late Imperial Brazilian Gold Mining Association	1832	20 2 0 0	242 0 0				
62. Found at Mount Blackwood, Victoria, on the surface of the ground; composed of gold, quartz, and oxide of iron (*)	1855	20 0 18 0	240 18 0	6·57	...	...	167 18 0
63. Fonnd at Yandoit, Castlemaine, Victoria, within 20 feet of the surface, a solid lump of gold	1860	20 0 0 0	240 0 0				
64. Found in the Ural Monntains, Russia	...	20 0 0 0	240 0 0				
65. Fonnd at White Hills, Maryborough, Victoria, at a depth of 12 feet, a solid lump of gold	1856	19 8 0 0	236 0 0				
66. Found at Kingower, Victoria, within half an inch of the surface	Feb., 1861	19 8 0 0	236 0 0				
67. Found at Cabarras County, North Carolina, United States	Whitney	19 5 6 0	233 6 0				
68. Fonnd at Kingower, Victoria, on the snrface of the grond, by a prospecting party; it was covered with green moss; when freed of quartz and moss weighed 188 oz. 15 dwt.	May, 1860	19 2 0 0	230 0 0				
69. Found at Carson's Creek, Stanislaus River, California; the property of the Bank of England	Aug., 1850	18 3 0 0	219 0 0				
70. Fonnd at New Chum Hill, Kiandra, Snowy River, N.S.W.	July, 1861	16 8 0 0	200 0 0				
71. Found in the Ural Mountains, Russia	...	16 2 0 0	194 0 0				
72. Found at Mount Korong, Victoria	Aug., 1859	16 0 0 0	192 0 0				
73. Found on the surface of the ground at Bryant's Ranges, 12 miles from Castlemaine, Victoria, white quartz and gold (*)	1854	15 3 8 12	183 8 12	4·41	95·50	22 $3\frac{3}{4}$	87 0 0

I.—Most Remarkable Specimens of Native Gold—*continued*.

—	Date of Discovery.	Gross Weight (Troy). lb. oz. dwt. gr.	Gross Weight (Troy). oz. dwt. gr.	Specific Gravity.	Assay. Gold per cent.	Assay. Carats.	Assay. Car. grs.	Estimate Weight of pure Gold. oz. dwt. gr.
74. Found at Tarrengower, Victoria	May, 1855	15 0 0 0	180 0 0					
75. Found at Maryborongh, Victoria, gold, quartz, and oxide of iron (*)	1854	14 10 16 0	178 16 0	5·25	...	...		103 14 0
76. Found in California; received at the United States Mint, 1849	...	14 6 0 0	174 0 0					
77. Found in the Ural Mountains, Russia	...	14 3 0 0	171 0 0					
78. Found in Victoria. On the surface of this nugget there was only a slight indication of gold, and until the specific gravity was taken almost valueless. Indeed, this was one of the most remarkable specimens ever tested. After taking the specific gravity, it was purchased to the mutual satisfaction of both parties; it was then broken np, when a solid lump of gold of an oval form was found in the centre (*)	1853	13 10 10 0	166 10 0	3·1	...	...		29 0 0
79. Found in Calaveras Co., California, at 15 feet from the surface. Estimated to contain 80 per cent. solid gold, at 17 dols. per oz =2,128 dols. or £459	...	13 4 10 0	160 10 0					
80. Found at Kiandra, Snowy River, N.S.W. ...	Mar., 1860	13 4 0 0	160 0 0					
81. Found at Meroo Creek, Turon River, N.S.W. near to No. 4.	1852	13 1 0 0	157 0 0					
82. Found at Evans' Gully, Kingower, Victoria ...	1861	12 9 10 0	153 10 0					
83. Found in Anson County, North Carolina, United States	Whitney, 1829	12 1 16 0	145 16 0					

84. Found at Jones's Creek, Mount Moliagul, Victoria (*)	1855	12	1	5	0	145	5	0						
85. Found by Chinamen, at Creswick Creek, Victoria	May, 1860	12	0	0	0	144	0	0	6·74	...	...	102	0	0
86. Found in Canadian Gully, Ballaarat, Victoria, at a depth of 60 feet, at the same time with another, No. 38. Sold in Melbourne, March 4th, 1853, (when it weighed 142 ozs. 15 dwts.) for £567 8s. 6d.=£3 19s. 6d. per oz.	Feb., 1853	11	11	15	0	143	15	0						
87. Found at Jones's Creek, Mount Moliagul, Victoria, at a depth of 20 feet. After pounding, to extract some quartz, it weighed 126 ozs.	...	11	8	0	0	140	0	0						
88. Found at the Tooloom Diggings, N.S.W., nearly solid gold	1860	11	8	0	0	140	0	0						
89. Found at Jim Crow, Victoria, at a depth of four feet	Sept., 1858	11	4	0	0	136	0	0						
90. Found at Mount Korong, Victoria, 4½ feet from the surface (*)	Oct., 1856	11	0	9	0	132	9	0	5·62	...	...	90	14	0
91. Found in Victoria (*)	1854	10	8	2	12	128	2	12	11·14	...	...	103	0	0
92. Found at Yecorata, Sinaloa, Mexico. It weighed 16 marcs 4 ozs. 4 ochavas; fineness, 22 carats. Deposited in the Royal Cabinet at Madrid	Robertson, about 1771	10	2	10	5	122	10	5						
93. Found at Kingower, Victoria, by a boy, a few inches beneath the surface	Sept., 1858	10	0	0	0	120	0	0						
94. Broken off quartz rock in a mine at Tarrengower, Victoria, quartz specimen (*)	1861	9	11	14	18	119	14	18	4·94	...	...	64	7	2
95. Found in California. Received at the United States Mint, 1849	...	9	7	12	0	115	12	0						
96. Found at Dunolly, Victoria, gold, quartz, and oxide of iron (*)	1854	9	2	9	0	110	9	0	12·05	...	...	100	2	14
97. Found at Kingower, Victoria	Sept., 1861	8	10	15	0	106	15	0						
98. Found at Mount Moliagul, by Chinamen; a solid lump of gold, value £400	Nov., 1857	8	8	8	0	104	8	0						
99. Found at Kingower, Victoria	Sept., 1861	8	4	10	0	100	10	0						

I.—Most Remarkable Specimens of Native Gold—*continued.*

—	Date of Discovery.	Gross Weight (Troy).		Specific Gravity.	Assay.			Estimate Weight of pure Gold.
					Gold per cent.	Carats.	Car. grs.	
		lb. oz. dwt. gr.	oz. dwt. gr.					oz. dwt. gr.
100. Broken off quartz rock in a mine at Tarrengower, Victoria (*)	1861	8 3 10 17	99 10 17	4·00	...	...		28 6 0
101. Found at Sonora, Mexico. Weight, 3 kilogrammes	Humboldt	8 0 9 0	96 9 0					
102. Found at Jim Crow, Victoria (*)	1855	7 11 6 0	95 6 0	4·88	...	...		50 12 0
103. Found at Kiandra, Snowy River, N.S.W. ...	Mar., 1860	7 9 18 0	93 18 0					
104. Found at Black Hill, Ballaarat, Victoria, a solid mass of gold, being the first largest piece of *solid* gold raised in the colony, or in any part of the British dominions	Oct. 14th, 1851	7 6 0 0	90 0 0					
105. Found at Louisa Creek, N.S.W., gold and quartz	Oct. 25th, 1851	7 6 0 0	90 0 0					
106. Found at Louisa Creek, N.S.W., a solid lump of gold	...	6 10 0 0	82 0 0					
107. Found at Mount Blackwood, Victoria (*) ...	1851	6 6 19 6	78 19 6	5·84	...	...		50 9 0
108. Found in Canadian Gully, Ballaarat, Victoria, in the same hole with No. 3	Jan. 31st, 1853	6 4 0 0	76 0 0					
109. Found in Victoria (*)	1854	5 5 3 0	65 3 0	7·3	...	...		48 4 0
110. Found by two boys at Gundagai (new diggings), N.S.W.	July, 1861	5 4 7 0	64 7 0					
111. Found in Victoria (*)	1855	5 1 18 0	61 18 0	5·18	...	...		34 17 0
112. Found in Victoria (*)	1854	5 0 9 0	60 9 0	5·05	...	...		33 12 0
113. Found in Victoria. Sold in Melbourne, 7th January, 1852, for 72s. 9d. per oz., the price of gold-dust, at the same time and place, being 59s. an oz.	1851	4 10 18 0	58 18 0					

114. Found at Store Creek, a tributary of the Nicholson River, Gipps Land, Victoria, being the largest lump yet found in Gipps Land	Jan., 1861	4 10 0 0	58 0 0				
115. Found in Victoria (*)	1855	4 9 15 0	57 15 0	6·56	...	...	40 2 0
116. Found in Victoria (*)	1854	4 3 17 12	51 17 12	12·06	...	...	47 1 0
117. Found at Louisa Creek, N.S.W., gold and crystalline quartz	1857	4 2 0 0	50 0 0				
118. Found in Victoria (*)	1854	4 1 14 12	49 14 12	4·829	...	...	26 2 0
119. Detached from the parent rock, Tarrengower, Victoria, quartz specimen (*)	1861	4 1 0 19	49 0 19	5·01	...	...	26 15 0
120. Found in Victoria (*)	1855	3 11 17 0	47 17 0	4·55	...	...	23 8 0
121. Broken from the quartz of a mine at Tarrengower, Victoria, quartz specimen (*)	1860	3 8 4 6	44 4 6	3·53	...	...	13 2 0
122. Found at Mount Blackwood, Victoria (*) ...	1855	3 6 11 0	42 11 0	9·43	...	...	36 5 0
123. Found at New Chum Hill, Kiandra, N.S.W. ...	July, 1861	3 6 0 0	42 0 0				
124. Found in Victoria (*)	1854	3 3 17 0	39 17 0	4·52	...	...	19 4 0
125. Broken off quartz rock in a mine at Tarrengower, Victoria, quartz specimen (*)	1860	2 4 15 12	28 15 12	4·11	...	...	11 4 0
126. Found at Leadhills, Lanarkshire, Scotland ...	about 1502	2 3 0 0	27 0 0				
127. Found at Croghan Kinshela, County Wicklow, Ireland. It contained about 92·3 per cent. gold, 6·27 silver, and 0·78 iron	1797	1 10 0 0	22 0 0				
128. Found at Merri Jig Creek, Gipps Land, Victoria	...	1 6 6 0	18 6 0				
129. Broken from quartz rock at Tarrengower, Victoria, quartz specimen (*)	1861	1 6 0 6	18 0 16	6·37	...	...	12 3 16
130. Found at Croghan Kinshela, County Wicklow, Ireland	1797	1 6 0 0	18 0 0				
131. Found at Summer Hill Creek, N.S.W. The earliest nugget found in N.S.W., after the gold discovery there by Hargreaves	13th May, 1851	1 1 0 0	13 0 0				
132. Found at Mount Blackwood, Victoria (*) ...	1855	0 11 3 11	11 3 11	5·69	...	...	6 18 0
133. Detached from quartz rock at Tarrengower, Victoria, quartz specimen (*)	1861	0 9 7 0	9 7 0	10·10	...	...	7 19 21

I.—MOST REMARKABLE SPECIMENS OF NATIVE GOLD—*continued.*

—	Date of Discovery.	Gross Weight (Troy). lb. oz. dwt. gr.	Gross Weight (Troy). oz. dwt. gr.	Specific Gravity.	Assay. Gold per cent.	Assay. Carats.	Assay. Car. grs.	Estimate Weight of pure Gold. oz. dwt. gr.
134. Found at Weisskirch, Austria	1851	0 9 0 0	9 0 0					
135. Found at Rocky River, Nelson, New Zealand, quite free from quartz	1858	0 8 14 0	8 14 0					
136. Found at Newfane, Vermont, United States; gold, with rock crystal	1826	0 8 10 0	8 10 0	16·5				
137. Found in New Zealand; gold and dark-colored quartz	1853	0 8 0 0	8 0 0					
138. Found at Canoona, Port Curtis, Queensland ...	1859	0 7 0 0	7 0 0					
139. Found at Touffe des Pins, Canada	...	0 4 0 0	4 0 0					
140. Found at Echunga, South Australia	Oct., 1852	0 2 14 0	2 14 0					
141. Found in Breadalbane, Perthshire, Scotland ...	...	0 0 2 0	2 0 0					
142. Found at Leadhills, Lanarkshire, Scotland; in the Cabinet of the late Lord Hopetoun	...	0 1 10 0	1 10 0					
143. Found at Echunga, South Australia, seven feet below the surface	1852	0 1 10 0	1 10 0					
144. Found at Avoca, Victoria, encrusted with black oxide of manganese (*)	1856	0 0 17 0	0 17 0					
145. Found in the parish of Creed, Cornwall, England	Borlase, 1756	0 0 15 3	0 15 3					
146. Found at Tangier (new diggings), Nova Scotia ...	1861	0 0 15 0	0 15 0					
147. Found in Fingal, Tasmania	...	0 0 12 0	0 12 0					
148. Found at Ballaarat, Victoria; much water-worn (*)	...	0 0 10 19	0 10 19	18·871	99·18	23	3⅛	

149. Found in Kildonan, Sutherlandshire, Scotland ...	...	0 0 10 0	0 10 0				
150. Found at Kingower, Victoria; it contained 61·9 per cent. gold, and 0·25 silver—the remainder composed of carbonate of bismuth and oxide of iron. Its appearance led many dealers in gold to suppose it was spurious metal. Any particles dropped into an acid effervesced strongly. An uncommonly rare specimen (*)	...	0 0 5 0	0 5 0	11.1			

II.—REMARKS.

The following data are deduced from the foregoing Record. 1st. That gold in nuggets, even of large size, may be found on the very surface of the ground, as in No. 4, and at a depth of 400 feet, as in No. 14. 2. Gold in large masses may be found, as in No. 14, without a particle of quartz, or any other non-metallic body. 3. Though it is usual to find with nuggets, quartz (oxide of silicon), alumina (oxide of aluminum), and rust (oxide of iron), these solid bodies being the most abundant in nature, yet such gold is also found with substances which are not common, such as iron pyrites, black oxide of manganese, and the very rare salt carbonate of bismuth. 4. It is interesting to observe that where carbonate of bismuth has been found along with gold, as at Kingower, the same locality has yielded an unusual number of large nuggets. 5. That gold in large masses, as in No. 1, is almost as pure, viz., 23 carats $3\frac{1}{4}$ c. grains, as the very finest gold dust, viz., 23 carats $3\frac{3}{4}$ c. grains. 6. The purest nuggets, like native silver and iron, have never been found absolutely free from alloy, that is chemically pure. 7. Silver and iron form the usual alloy of the purest gold in large masses, and these metals are also found in the purest gold-dust. 8. The variety of substances recorded above, as accompanying masses of gold, seem to confirm the fact lately announced, that though gold be obtained almost invariably in the metallic state, yet like silver and all the common metals, it may also be found as an oxide,—Dr. Percy, of London, having produced minute traces of gold from litharge (protoxide of lead), white lead (carbonate of lead), and sugar of lead (acetate of lead), and I have, after many careful experiments, extracted gold from the red crystals of tin-ore (peroxide of tin) found at the Ovens 9. The largest mass of gold on record (No. 1) was found in Victoria in 1858; this pepita was almost twice as heavy and valuable as the great Russian nugget found in 1842, and four times that of the famous "grain of gold" found in Hayti in 1502. 10. As the largest lumps (pepitas Nos. 1 and 2) of gold ever known were discovered in Victoria, though not until six years after the gold discovery there, it is probable that still larger masses will yet be found.

Assay Office, Collins-street west,
Melbourne, September 21, 1861.

WILLIAM BIRKMYRE.

VICTORIAN AGRICULTURAL STATISTICS FOR THE YEAR ENDING 31st MARCH, 1861.

To the valuable statistics furnished by Mr. Archer, the Editor of this Catalogue is enabled, by the kindness of Mr. C. E. Bright, to add the following, derived from authentic sources, and bringing down the history of our Agricultural progress and of our external Commerce to the 31st of March, 1861:—

LAND.

Total extent of Land under Cultivation.

	Acres.
In the year 1861	419,252
„ 1860	358,727
Increase	60,525

GRAIN CROPS.

Gross Produce in Victoria, for the Year ending 31st March, 1861.

	Wheat. Bush.	Oats. Bush.	Barley. Bush.	Maize. Bush.	Rye & Bere. Bush.
Total, 1861	3,456,072	2,626,056	83,410	24,992	1,690
Total, 1860	2,296,157	2,553,637	98,433	7,374	2,692
Increase	1,159,915	72,419	—	17,618	—
Decrease	—	—	15,023	—	1,002

	Millet and Sorghum, Peas, Beans. Bush.	Total.
Total, 1861	11,983	6,204,204
Total, 1860	5,589	4,963,883
Increase	6,394	1,240,321

GREEN CROPS.

Gross Produce of Green Crops for the Year ending 31st March, 1861.

	Potatoes. Tons.	Turnips. Tons.	Mangel Wurzel. Tons.	Beet, Carrots, and Parsnips. Tons.	Cabbage. Tons.	Total. Tons.
Total, 1861	77,327	2,276	13,399	2,228	1,907	97,139
Total, 1860	48,967	673	4,645	743	355	55,384
	28,360	1,603	8,754	1,485	1,552	41,755

HAY.

Gross Produce for the Year ending 31st March, 1861.

	Cereal Grasses. Tons.	Rye Grasses. Tons.	Total. Tons.
Total, 1861	142,557	1,367	143,625
Total, 1860	135,246	396	135,643
Increase	7,311	671	7,982

OTHER CROPS.

Gross Produce for the Year ending 31st March, 1860 and 1861.

	Onions. Cwt.	Tobacco. Cwt.	Vines. No.	Fruit sold. Cwt.	Wine produced. Galls.	Brandy manftd. Galls.
Total, 1861	26,028	1,255	2,838,558	8,069	11,642	260
Total, 1860	1,029	463	1,896,939	4,473	13,966	150
Increase	24,999	792	941,619	3,596	—	110
Decrease	—	—	—	—	2,324	—

CEREALS COMMONLY CULTIVATED IN EUROPE.

Imports of Bread Stuffs into Victoria, from January to December inclusive.

	Wheat. Bush.		Wheat into Flour. Tons.	Flour. Tons.	Total Flour. Tons.
During 1855	188,302	or	4,006	36,920	40,926
„ 1856	147,123	„	3,130	43,247	46,377
„ 1857	210,190	„	4,472	38,409	42,881
„ 1858	274,609	„	5,842	25,506	31,348
„ 1859	388,098	„	8,457	25,435	33,892
„ 1860	483,156	„	10,279	24,514	34,793

Memo.—Forty-seven bushels Wheat are taken to one ton Flour.

OTHER GRAIN.

Imports into Victoria, from January to December inclusive.

	1858. Bushels.	1859. Bushels.	1860. Bushels.
Barley	128,255	54,834	14,963
Beans and Peas	13,380	10,336	4,917
Maize	157,100	370,062	484,056
Malt	220,777	103,546	251,946
Oats	1,725,092	1,221,773	1,033,411

WOOL—FLEECE AND SCOURED.

Exports from Victoria during the Year ending the 31st March, 1859.

In 1859	were	21,056,406 lbs.
„ 1860	„	22,167,069 „
„ 1861	„	23,588,490 „

From Melbourne, in the year ending 31st March, 1860, there were 57,976 bales of Wool shipped in fifty-five vessels. In 1861, 61,988 bales of Wool shipped in fifty-one vessels.

HIDES.

The Exports from Victoria in twelve months, ending March, 1859,

In 1859	were 151,888 hides
„ 1860	„ 155,911 „
„ 1861	„ 151,427 „

SKINS.

The Exports from Victoria,

In 1859	werc 157,856
„ 1860	„ 225,885
„ 1861	„ 155,472

HORNS AND HOOFS.

The Exports from Victoria,

In 1859	were 299,000
„ 1860	„ 267,952
„ 1861	„ 336,853

BONES.

The Exports from Victoria,

In 1859	were 640 tons
„ 1860	„ 464 „
„ 1861	„ 391 „

TALLOW.

The Exports from Victoria,

In 1859	were 654 tons
„ 1860	„ 281 „
„ 1861	„ 728 „

FISH, OILS, BONES, AND SKINS.

Imports into Victoria, from January to December inclusive.

	1858.	1859.	1860.
Fish—Preserved	30,822 packages	12,471 packages	22,359 packages
„ Salted	862 tons	948 tons	485 tons
Oil—Black	4,630 gallons	3,986 gallons	6,587 gallons
„ Cocoa Nut	2,052 „	16,172 „	14,245 „
„ Colza	12,848 „	10,553 „	78,420 „
„ Linseed	46,020 „	36,659 „	57,892 „
„ Olive	8,715 „	5,303 „	17,953 „
„ Rape	12,884 „	11,189 „	12,650 „
„ Sperm	23,225 „	21,889 „	13,268 „
„ Undescribed	217,669 „	129,689 „	234,580 „

BREADSTUFFS.

Imports into the Port of Melbourne, only, during the year 1856 to 1860, from January to December inclusive.

	1856. Tons.	1857. Tons.	1858. Tons.	1859. Tons.	1860. Tons.	Total Tons.
From Colonies	23,065	30,927	23,186	23,642	17,997	118,819
From Abroad	18,967	5,664	2,483	9,536	15,153	51,805
Total	42,032	36,591	25,669	33,178	33,150	170,624

CEREALS CULTIVATED ELSEWHERE.

Imports into Victoria, from January to December inclusive.

	1858.	1859.	1860.
Gram	3,094 tons	3,639 tons	581 tons
Rice	8,642 "	15,721 "	10,295 "
Dholl	—	33 "	1 cwt.

HOPS AND OTHER AROMATIC PLANTS USED IN BREWING.

Imports into Victoria, from January to December inclusive.

	1858.	1859.	1860.
Hops	588,446 lbs.	415,819 lbs.	492,339 lbs.

FLOURS OR PREPARATIONS OF THE ABOVE CLASSES.

	1858.	1859.	1860.
Meal—Barley	13 tons	13 tons	18 tons
" Corn	117 "	1 "	3 "
" Linseed	53 "	½ "	5 "
" Oat	395 "	690 "	796 "

MEATS—SALTED, SMOKED, OR DRIED.

	1858.	1859.	1860.
Bacon	480 tons	724 tons	964 tons
Beef	44 "	114 "	97 "
Ham	734 "	777 "	1,046 "
Pork	69 "	251 "	280 "

MEAT, PRESERVED.

	1858. Packages.	1859. Packages.	1860. Packages.
Provisions preserved	27,042	17,910	7,756

CATALOGUE.

ABBREVIATIONS EMPLOYED.—*Des.*, Designer or Modeller; *Ex.*, Exhibitor; *Inv.*, Inventor; *Imp.*, Importer; *Ma.*, Manufacturer; *Pat.*, Patentee; *Pro.*, Producer; *S.*, for Sale.

CLASS I.

AGRICULTURAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

COMMITTEE:

CHARLES GAVAN DUFFY, ESQ., M.P.
WILLIAM CLARKE HAINES, ESQ., M.P.
ROBERT MCDOUGALL, ESQ.
CHARLES E. BRIGHT, ESQ.

1. AITKEN, THOMAS, Victoria Parade Brewery.—1 barrel of Ale and 1 of Porter. *Ma.*
2. BAYLES AND CO., 97 Collins-street west.—2 bags Wheat. *Ma.*
3. BARMBY AND VERITY, MESSRS., Bridge-road, Richmond.—Smoked Beef Ham. *Pro.*
4. BENCRAFT, G., Flinders-lane west.—Oat Meal, Pease Meal, Maize Meal. *Ma.*
5. BIGNELL AND EDOLS, 163 Great Bourke-street.—Preserved Meats, assorted; Salted Meats, assorted; Dried Beef, Tongues, Sausages, and Hams. *Pro.*
6. CASTLEMAINE COMMITTEE.—Wheat and Oats.
7. COX, W. S., Bourke-street.—Spiced, Rolled, and Dried Bacon. *Pro.*
8. CUNDY AND STACK, MESSRS., Mount Alexander.—Sample of Barley grown at Mount Alexander. *Ex.*
9. DANELLI, S., Sydney-road, Brunswick.—Maccaroni and Vermicelli. *Ma.*
10. DEWER, J., Gisborne.—Sample bag of Wheat. *Ex.*
11. DOCKER, REV. J., Wangaratta.—Sample bag of Wheat. *Ex.*
12. DOEPPER, H., Richmond.—Maccaroni and Vermicelli. *Ma.*

13. Elliott and Fawns, Sandhurst.—2 hhds. Ale. *Ma.*

14. Fallon, J. F., Albury.—Sample of Wheat. *Ex.*

15. Finlay, J.—Samples of Oats. *Ex.*

16. Fordham, F., Emerald Hill.—Cured and Smoked Hams, Bacon, Tongues. *Pro.*

17. Fry, James, Ascot Mills, Ascot.—1 bag Flour, 1 box Flour. *Ma.*

18. Gough and Co, Messrs., 115 Lennox-street, Richmond.—2 sacks Malt made from Victorian Barley, 2 sacks made from Californian Barley, sample of Black Malt. *Ma.*

19. Guest and Co., Messrs., William-street.—Ship and Cabin Biscuits. *Ma.*

20. Henderson and Sons, Flinders-lane.—1 hhd. Ale. *Ma.*

21. Hodges, Mrs., Phillipstown.—1 bottle Honey taken 1856, 1 ditto 1861, 1 ditto Mead. *Ex.*

22. Johnson, J., Port Albert.—Prime Mess Pork, 336 lbs. net, branded with Curer's name. 2 tierces Salted Meat. *Pro.*

23. Lansdell, S., Melbourne.—Potato Flour. *Ma.*

24. Lawrence, W.—Stilton Cheese. *Ma.*

25. Lormer, R., 92 Spencer-street.—Machine-made Biscuits, various. *Ma.*

26. McCracken and Co., Messrs., Little Collins-street west.—2 barrels of Ale. *Ma.*

27. McKenzie and Co., Messrs., 35 Lygon-street.—Oatmeal and other Preparations of Grain, Chicory of Colonial growth. *Ma.*

28. Murcutt, Terry and Co., Messrs., Wharf Brewery.—2 barrels of Ale.

29. Ovens Local Exhibition Committee.—Samples of Wheat, Flour, and Maize. *Ex.*

30. Ramsden, S., Carlton Flour Mills.—2 bags Flour, 1 bag Bran. *Ma.*

31. Smith, Thomas, Albert-street, Collingwood.—2 bags Wheat. *Ex.*

32. Smith Brothers, 123 Queensberry-street, Hotham.—Beef, Ham, and Rolled Bacon, cured by Exhibitor.

33. Smith and Son, 71 Gore-street, Fitzroy.—Assorted Biscuits, made of Victorian Flour; Ginger Cake. *Ma.*

34. Swallow and Co., Sandridge.—Biscuits, various kinds. *Ma.*

35. Vaughan and Wild, Collingwood Brewery.—2 barrels of Ale. *Ma.*

36. Wallace, J., Beechworth.—Bottled Ale and Porter (Colonial). *Ma.*

CLASS II.

HORTICULTURAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

COMMITTEE:

HON. J. H. BROOKE, M.P., V.P.
DR. EADES.
DR. MUELLER.

DIVISION S.—COLORED GYPSUM CASTS OF FRUITS AND VEGETABLES.

Name of Fruit, &c.	No.	Exhibitors.	Locality where grown.
APPLES.			
Astrachan Red	42	Mr. J. Carson ...	Studley Park.
Australian Pippin ...	77	Mr. Whatmough	Queensberry.
Beauty of Kent	74	Mr. J. Rule ...	Richmond.
Blenheim Orange ...	28	Mr. J. C. Cole ...	Richmond.
Crown Codlin	43	Mr. J. Carson ...	Studley Park.
Cornish Gillyflower ...	70	Mr. Perry ...	Grange, Heidelberg Road.
Country White Pippin ...	72	Mr. T. C. Cole ...	Richmond.
Claygate Pearmain ...	82	Mr. Perry ...	Grange, Heidelberg Road.
Dumelow's Seedling ...	66	Mr. Perry ...	Grange, Heidelberg Road.
Emperor Alexander ...	3	Mr. Burton ...	St. Heliers.
Emperor Alexander ...	25	Mr. O'Neill ...	Brighton.
Emperor Alexander ...	31	Mr. Huntley ...	Brighton.
Emperor Alexander ...	59	Mr. Holt ...	Boroondara.
Tower of Glammis ...	78	Mr. Perry ...	Grange, Heidelberg Road.
French Reinette ...	79	Mr. Perry ...	Grange, Heidelberg Road.
French Crab	87	Mr. Perry ...	Grange, Heidelberg Road.
Golden Pippin	22	Mr. T. C. Cole ...	Richmond.
Golden Harvey	101	Mr. Holt ...	Boroondara.
Hoary Morning	32	Mr. Huntley ...	Brighton.
Holland Pippin	76	Mr. Johnson ...	Boroondara.
Hawthornden	102	Mr. Holt ...	Boroondara.
Kentish Fill Basket ...	58	Mr. Whatmough	Queensberry.
Kentish Fill Basket ...	75	Mr. Johnson ...	Boroondara.
Lord Nelson	23	Mr. O'Neill ...	Brighton.
Lord Nelson	57	Mr. T. C. Cole ...	Richmond.
Lord Nelson	98	Mr. Williamson	Lexton.
Lawrence Pippin ...	56	Mr. Holt ...	Boroondara.
Monster Reinette ...	73	Mr. Holt ...	Boroondara.

DIVISION S.—CASTS OF FRUIT AND VEGETABLES—*continued.*

Name of Fruit, &c.	No.	Exhibitors.	Locality where grown.
APPLES—*continued.*			
Northern Greening ...	67	Mr. Holt ...	Boroondara.
Norfolk Beaufin ...	105	Mr. Holt ...	Boroondara.
Orsantine	30	Mr. Huntley ...	Brighton.
Passe Pomme	55	Mr. Holt... ...	Boroondara.
Quarrenden Red... ...	65	Mr. Whatmough	Queensberry.
Royal Sovereign... ...	26	Mr. Johnson ...	Boroondara.
Royal Pearmain	29	Mr. Huntley ...	Brighton.
Ribston Pippin	34	Mr. Huntley ...	Brighton.
Royal Sovereign	68	Mr. Holt	Boroondara.
Reinette de Canada ...	71	Mr. Holt... ...	Boroondara.
Rhode Island Greening...	103	Mr. Holt... ...	Boroondara.
Royal Russet	104	Mr. Holt... ...	Boroondara.
Stone Pippin	44	Mr. J. James ...	South Brighton.
St. Lawrence	84	Mr. T. C. Cole ...	Richmond.
Scarlet Nonpareil ...	85	Mr. Perry ...	Grange, Heidelberg Road.
Stirling Castle	109	Mr. Holt... ...	Boroondara.
Stone Pippin	168	Mr. Jas. Henty...	Hawthorn.
Seedling	137	Mr. R. Whatmough	Lower Plenty.
Wellington Pippin ...	80	Mr. Johnson ...	Boroondara.
Wheeler's Russet ...	108	Mr. Holt... ...	Boroondara.
PEARS.			
Althorp Crassane ...	93	Mr. J. Carson ...	Studley Park.
Bon Chretien, William ...	1	Mr. Holt ...	Boroondara.
Bon Chretien, Summer...	2	Mr. Burton ...	St. Heliers.
Bergamot, Victorian ...	8	Mr. T. C. Cole ...	Richmond.
Bergamot, Autumn ...	45	Mr. Perry ...	Grange, Heidelberg Road.
Bergamot, Orange ...	10	Mr. Holt ...	Boroondara.
Beurré d'Ahremberg ...	11	Mr. T. C. Cole ...	Richmond.
Bon Chretien	33	Mr. Huntley ...	Brighton.
Belle d'Angeville ...	37	Mr. Edsel ...	Brighton.
Brown Windsor	B43	Mr. J. James ...	South Brighton.
Beurré Diel	48	Mr. Perry ...	Grange, Heidelberg Road.
Beurré de Capiaumont ...	47	Mr. Perry ...	Grange, Heidelberg Road.
Bishop's Thumb	49	Mr. Perry ...	Grange, Heidelberg Road.
Beurré Spencé	51	Mr. Perry ...	Grange, Heidelberg Road.
Beurré Rancé	88	Mr. Perry ...	Grange, Heidelberg Road.
Beurré Grosse	89	Mr. Perry ...	Grange, Heidelberg Road.
Beurré Brown	92	Mr. J. Carson ...	Studley Park.
Beurré de Bolviller ...	106	Mr. Holt ...	Boroondara.
Beurré Gifford	110	Mr. Holt ...	Boroondara.
Crassane (Cole's early)...	6	Mr. T. C. Cole ...	Richmond seedling.

Division S.—Casts of Fruit and Vegetables—*continued.*

Name of Fruit, &c.	No.	Exhibitors.	Locality where grown.
Pears—*continued.*			
Crassane	35	Mr. Young ...	Pascoevale.
Crassane	154	Mr. J. Carson ...	Studley Park.
Catillac	139	Mr. R. Whatmongh	Lower Plenty.
Duchess d'Augouleme ...	155	Mr. J. Carson ...	Studley Park.
Forelle (Tront pear) ...	53	Mr. Perry ...	Grange, Heidelberg Road.
Knight's Monarch ...	54	Mr. Perry ...	Grange, Heidelberg Road.
Lansac Dauphine ...	46	Mr. Holt ...	Boroondara.
Moorfowl Egg	94	Mr. J. Carson ...	Studley Park.
Maria Louise	169	Mr. J. Carson ...	Studley Park.
Maria Louise	52	Mr. Perry ...	Grange, Heidelberg Road.
Napoleon	36	Mr. Bean ...	Kew.
Richmond Seedling ...	7	Mr. T. C. Cole ..	Richmond.
St. Germain	...	Mr. T. C. Cole ...	Richmond.
Seedling pears (two) ...	...	Mr. T. C. Cole ...	Richmond.
Uvedals, St. Germain ...	138	Mr. Roberts ...	Boroondara.
Uvedals, St. Germain ...	140	Mr. Kirk ...	Heidelberg.
Not named	170	Sir Redmond Barry	
Miscellaneous Fruits.			
Capsicnm	90	J. Carson, Esq. ...	Stndley Park.
Cherry, Arch Duke ...	...	Mr. G. Cole ...	Gardiner's Creek.
Cherry, Bigarreau ...	...	Mr. W. Huntley	Brighton.
Cherry, Black Tartarian	...	Mr. F. Lansley ...	Boroondara.
Cherry, Claremont ...	...	Mr. R. Cole ...	Preston.
Cherry, Early May Duke	...	Mr. G. Cole ...	Gardiner's Creek.
Cherry, Florence ...	...	Mr. R. Cole ...	Preston.
Cherry, Holman's Duke...	...	Mr. G. Cole ...	Gardiner's Creek.
Cherry, Seedling ...	...	Mr. G. Cole ...	Gardiner's Creek.
Cherry, Waterloo ...	...	Mr. G. Cole ...	Gardiner's Creek.
Cherry, White Heart ...	...	Mr G. Cole ...	Gardiner's Creek.
Cucumber, White ...	64	Handasyde and MacMillan	Caulfield.
Fig, White Ischia ...	99	Mr. Sangster ...	Como.
Gonrd	152	Melbourne Botanic Gardens	
Gourd, Bottle	144	W. Law and Co.	Melbonrne.
Gourd, Chinese ...	143	R. Bartlett, Esq.	Richmond.
Gourd, French Miniature	153	Melbourne Botanic Gardens	
Lemons (2)	164	J. Carson, Esq. ...	Stndley Park.
Lemons	...	T. A. Brown, Esq.	Heidelberg.
Lime (2)	165	J. Carson, Esq. ...	Studley Park.
Marrow, Vegetable ...	141	Mr. T. Holt ...	Boroondara.
Marrow, Custard (1) ...	149	Melbourne Botanic Gardens.	
Marrow, Custard ...	151	Melbourne Botanic Gardens.	

DIVISION S.—CASTS OF FRUIT AND VEGETABLES—*continued.*

Name of Fruit, &c.	No.	Exhibitors.	Locality where grown.
MISCELLANEOUS FRUITS—*continued.*			
Marrow, English ...	150	Melbourne Botanic Gardens.	
Melon, Pie	147	Melbourne Botanic Gardens.	
Melon, Water	146	Melbourne Botanic Gardens.	
Melon, Spotted Water ...	148	Melbourne Botanic Gardens.	
Orange	163	J. Carson, Esq....	Studley Park.
Orange, Navel (3) ...	166	The Hon. J. H. Brooke, Esq.	Heidelberg.
Orange, Rio (2)	167	The Hon. J. Henty, Esq.	Boroondara.
Pea, Giant Sugar (2) ...	...	Melbonrne Botanic Gardens.	
Pea, Skinless Sugar (2)...	...	Melbourne Botanic Gardens.	
Plum, Cherry	...	Mr. G. Cole ...	Gardiner's Creek.
Plum, Coe's Golden Drop	4	Mr. T. Burton ...	St. Heliers.
Plum, Magnnm Bonum (2)	0	Mr. H. Hopwood	Echuca.
Pumpkin	142	Mr. Elderton ...	Melbourne.
Pumpkin	159	Messrs. Reynolds and Co. ...	Melbourne.
Pumpkin	160	Messrs. Reynolds and Co.	Melbourne.
Pear-shaped Quince ...	145	L. Jones, Esq. ...	Avenel.
Pear-shaped Quince ...	97	Mr. Stone ...	Brighton.
Pear-shaped Quince ...	156	Mr. J. L. Brown	Murray River.
Shaddocks (2)	162	J. Carson, Esq....	Studley Park.
Strawberries (6)... ...	...	— Clarson, Esq.	Preston.
Walnnt	91	Mr. T. Burton ...	St. Heliers.
Raspberries (2)	...	Mr. T. C. Cole ...	Richmond.

DIVISION T.—COLORED GYPSUM CASTS OF EDIBLE ROOTS.

Name of Article.	No.	Exhibitors.	Locality where grown.
Beetroot, red	63	Mr. Stone ...	Brighton.
Beetroot, red field ...	120	Mr. W. Dnnston	Newlands.
Carrots (2)	...	Mr. Stone ...	Brighton.
Carrots, field	121	Mr. W. Dunston	Newlands.
Carrots, intermediate ...	62	Mr. Stone ...	Brighton.
Carrots, short horn ...	61	Mr. Stone ...	Brighton.

Division T.—Casts of Edible Roots—*continued.*

Name of Article.	No.	Exhibitors.	Locality where grown.
Mangel-wurzel	119	Mr. W. Dunston	Newlands.
Mangel-wurzel, orange globe	118	Experimental Farm.	
Onion, Spanish	115	Mr. W. Dunston	Newlands.
Onion, Tripoly	114	Mr. W. Dunston	Newlands.
Parsnip	122	Mr. Stone ...	Brighton.
Potato	161	Mr. W. Clark ...	Melbourne.
Potato, Brown's River ...	27	Mr. McLean ...	Lower Plenty.
Potato, Prince Regent ...	117	Mr. W. Dunston	Newlands.
Potato, purple kidney ...	116	Mr. W. Dunston	Newlands.
Sweet potatoes (2)	158 157	Mr. Allit ...	Portland.

Glass cases, containing the fruit, are made of—

No. 1. Eucalyptus sideroxylon, No. 2. Acacia melanoxylon, No. 3. Lomatia Frazerii, No. 4. Exorarpus cupressiformis — with cedar bottom.

No. 5. Myrsine variabilis, with Huon pine bottom.

DIVISION B.—SEEDS GROWN IN VICTORIA.

Almonds ... ... T. Bates, jun. ... Station Peak

(The box containing them made of blackwood and red cedar.)

Miscellaneous seeds, exhibited by Messrs. Reynolds and Co., Melbourne:—Beans (French dwarf), beans (Windsor), carraway, carrot, chicory, curled cress, holcus saccharatus, lettuce, mangel-wurzel, marrow vegetable, mustard, onions, parsnip, peas (Bedman's imperial), dwarf, imperial dwarf, marrow, poor man's, spider, rye grass seed, sorghum, tares, thorny acacia, Virginian tobacco seed, wattle seed.

DIVISION C.—NEW ZEALAND FLAX AND OTHER FIBRES.

Name of Article.	Exhibitors.	Locality.
Fibres of American cotton, grown at Heathcote	Jas. Liddy, Esq.	Heathcote.
New Zealand flax	L. Read, Esq. ...	Collingwood.
Riga flax, raw and prepared...	E. Bappmann, Esq.	Castlemaine.
Yucca gloriosa, from leaves grown in the Melbourne Botanic Gardens	Dr. F. Mueller.	

DIVISION D.—MISCELLANEOUS.

Name of Article.	Exhibitors.	Locality.
Arrowroot (Maranta) ...	Rev. J. Docker ...	Wangaratta.
Arrowroot (Canna)... ...	Sam. Jeffrey, Esq.	
Chicory	Jas. McKenzie, Esq.	Melbourne.
Cigars of colonial tobacco ...	— Crompton, Esq.	Albury.
Ginger, grown in the Melbourne Botanic Gardens	Dr. F. Mueller.	
Hyoscyamus tinture, ext. and fol.	J. Barnard ...	Kew.
Medicinal herbs	J. Mears.	
Olive oil	E. Caulfield ...	Toorak.
Potato flour	S. Landsell ...	Melbourne.
Preserved fruits	R. Stewart ...	Geelong.
Snuff	— Frauenfelder	Albury.
Sugar of sorghum	Commissioners.	
Tea, Chinese	Dr. F. Mueller ...	Prepared from leaves grown in the Melbourne Botanic Gardens.
Tomato sauce	E. Zorn.	
Tomato sauce	— Adamson ...	Queenscliff.

37. Abel, A. T., Ballaarat.—White Colonial Wine. *Ma.*

38. Anduske, S., German Town, near Geelong.—Wine: Madeira, 6 bottles; Espar, 6 bottles. *Ma.*

39. Barker, J. and R., 27 Victoria Parade.—A small case of Silk, from Silkworms fed on black mulberry at Cape Schanck. *Pro.*

40. Bieske, S., German Town, near Geelong.—Red Espar, 6 bottles; White Madeira, 6 bottles. *Ma.*

41. Brequet, F., Geelong.—6 bottles Neufchatel Red Wine, 6 bottles Burgundy Red, 6 bottles White Australian Sauterne. *Ma.*

42. Brequet, F., Jun., and Co., Geelong.—6 bottles Hermitage. *Ma.*

43. Brown, J. S., Maryborough.—Sample of Garden Seeds. *Ex.*

44. Carson, J., 39 Collins-street east.—Wine: Red Yelabra, 6 bottles; White Yelabra. *Ma.*

45. Coates, Dr., South Yarra.—Dye obtained from the Coccus insect in the blue gum Eu Globulus. *Ma.*

46. Connor, D.—Sugar made from Sorghum Saccharatum. *Ma.*

47. Cooper, R., 18 A'Beckett-street east.—Wine: Red Victoria, 1860, 24 bottles; Red Victoria, 1861, 24 bottles; White Victoria, 1860, 24 bottles. *Ma.*

48. Cropper, W. H.—Silk grown at St. Kilda and wound by hand from dry cocoons. Silkworms fed on lettuce leaves. *Pro.*

48*a*. Crompton, Beechworth.—Cigars made from Native Tobacco. *Ma.*

49. DARDANELLI, Melbourne.—Silk from cocoons fed on black mulberry leaves, by Miss S. King, Brighton. *Ex.*

50. DE CASTELLA AND ANDERSON, 127 Flinders-lane east.—Yering (Wine).

51. DICKSON, JAMES, 9 Latrobe-street east.—Cordials, Liqueurs, Malt Vinegar, and Blacking. *Ma.*

52. DIXON, P. G., Rosslyn-street, Melbourne.—Cordials, assorted. *Ma.*

53. DUMONT, L., Punt-road Vineyard, South Yarra.—2 bottles Hermitage, red; 2 bottles Hermitage, white; 2 bottles Pineau Blanc. *Ma.*

54. DUNOYER, J., Geelong Post-office.—6 bottles Chillon, 6 bottles White Pineau. *Ma.*

55. EATON, H. F.—Melon Preserve. *Ma.*

56. EVANS, M., Melbourne.—Native Sarsaparilla. *Ma.*

57. EVERIST, T. J., Town Hall, Melbourne.—Carignan, Gouais, Mataro Wine. *Ma.*

58. FALLON, J. F., Albury.—Wine, 6 bottles Scyras (1858), 6 bottles Reisling (1858), 6 bottles Carbeitral Sauvignon (1858), 6 bottles Mixed Grapes (1860), 14 bottles various qualities, 6 bottles Reisling, and 6 of Red Wine. *Ma.*

59. FORDHAM, F., Emerald Hill.—Jams, Bottle Fruits, Candied Peel, Tomato Sauce, and Marmalade. *Ma.*

60. FYANS, CAPTAIN.—Model of a Pear.

61. GIBBONS, W. S., 5 Collins-street east.—Samples illustrating processes for purifying mixed liquids. *Ex.*

62. GROSMANN, 63 Flinders-street east.—6 bottles Burgundy (real). *Ma.*

63. HENTY, JAMES, Richmond.—Wine: Yarraberg, 1 dozen bottles. *Ma.*

64. HIRSCHI, F., Castlemaine.—Wine: 8 bottles, Red Mount Alexander; 8 bottles, White Mount Alexander. *Ma.*

65. KETTLER, J., St. Kilda.—Colonial Wine, 3 sample bottles. *Ma.*

66. KRUSE, J. AND Co., Melbourne.—Mineral Waters (6 sorts). *Ma.*

67. LEE, P., St. Kilda.—2 boxes of Cigars, made in the Colony, of imported tobacco. *Ma.*

68. LEMME AND Co., Castlemaine.—Wine: 6 bottles, Red Castlemaine; 6 bottles White Castlemaine. *Ma.*

69. LIDDY, JAS.—2 samples of the Cotton plant. *Ex.*

70. LOUGHNAN AND Co., MESSRS., 6 Western Market.—Victorian Tobacco (Virginian leaf). *Ex.*

71. MACKENZIE, A, Geelong.—Model of Sweet Water Grapes (136).

72. MacMillan, A. C., Brighton.—1 dozen Brandy, distilled from Victorian grapes; 2 dozen Red Wine, principally from Hermitage Grapes. *Ma.*

73. MacMullan, W., Geelong.—Wine: 6 bottles Burgundy, 6 bottles Sauterne, 12 bottles Frontignac. *Ma.*

74. Mate and Co., Albury.—Wines: Aucarot, Tokay, Brown Muscat, Muscat of Alexandria and Hermitage. *Ma.*

75. Niffenecker Bros., near Geelong.—6 bottles Cluster, 6 bottles Cluster and Glory mixed, 6 bottles Auverna, 6 bottles Sparkling Chasselas, 6 bottles Brandy made from the husks of grapes, 6 bottles of Brandy made from husks, lees, and peaches. *Ma.*

76. Peddle, Mrs.—2 bottles Tomato Sauce. *Ma.*

77. Prevot and Co., Messrs., 128 Queen-street.—Assorted Cordials and Effervescing Beverages. *Ma.*

78. Rollo, J. B., Brunswick.—Potatoe-grafting applicable to Vine Culture. *Ex.*

79. Sadler, T., Maryborough-street, St. Kilda.—Silk from silk-worms reared at Caulfield.

80. Sanger, J. M., Albury.—Aucarot, Reisling, and Reisling and Malbec Wine. *Ma.*

81. Schneider, J., Nunawading.—6 bottles Wine. *Ma.*

82. Seidel, A. and B., Barrabool Hills, Geelong.—Models of Black Prince (126), Vantage (157), Tokay (129), Chasselas (131) Grapes.

83. Seidel, A., Ceres Nursery, Geelong.—Wine: Burgundy and Swerdun, with Model of Wine Press. *Ma.*

84. Seidel, B., Ceres Nursery, Geelong.—Wine: Burgundy and Swerdun. *Ma.*

85. Simpson, G., 91 Little Bourke-street west.—Assorted Cordials and Effervescing Beverages. *Ma.*

86. Stewart, R., Ryrie-street, Geelong.—Fancy Biscuits, Jams, Orange Marmalade, Preserved Lemon and Citron Peel. *Ma.*

87. Thomas, J., Geelong.—White and Red Wines. *Ma. for Ex.*

88. Tuckett, W. H., St. Kilda.—Wine. *Ma.*

89. Upston, R., 26 Moorabool-street, Geelong.—Burgundy Wine, 3 varieties. *Ma.*

90. Victoria Sugar Company, 4 Queen-street, Melbourne.—Refined Sugar, various qualities; Raw Sugar, Treacle, Spirits of Wine, and Rum. *Ma.*

91. Wanke, G.—8 bottles Chablis Wine, 9 ditto Hermitage. *Ma.*

92. Weber Brothers, Messrs., St. James's Vineyard, Batesford.—12 bottles of Chasselas Wine, White; 6 bottles Red Burgundy, 6 bottles White Sweetwater-Hermitage. *Ma.*

93. Wilson and Co., Messrs., 97 Webb-street, Fitzroy.—British Wines, Syrups, Malt Vinegar, and Blacking; Stoved Table Salt. *Ma.*

CLASS III.

INDIGENOUS VEGETABLE PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

COMMITTEE:

THE HON. RICHARD HEALES, Esq., M.P. | DR. EADES. | DR. MUELLER.

DIVISION A.—TIMBER SPECIMENS.

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
Acacia doratoxylon, Cunn.	Spearwood ...	Ovens ...	The Commissioners	A small tree, restricted to the north-east part of the colony. The durable and hard wood may be employed for cabinet work, and is used by the aborigines for the manufacture of their spears and other weapons.
Acacia homalophylla, Cunn.	Myall ...	Murray ...	The Commissioners	Tree attaining a height of about 30 feet, and about 1 foot in diameter. Through the north-west desert. About the uses of this, and many of the following kinds of wood, see jurors' report.
Acacia implexa, Bth. ...	...	Ovens ...	The Commissioners	A middle sized tree, scattered over ridges from Port Phillip to the Pyrenees and Upper Murray. Wood useful for cabinet work.

DIVISION A.—TIMBER SPECIMENS—*continued.*

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
Acacia leprosa, Sieb. ...	Hickory Acacia	Gipps Land ...	The Commissioners	Usually a rather small tree, with slender stem; frequent in moist forest valleys through the southern and eastern part of the colony. An excellent wood for furniture.
Acacia linearis, Sims ...	...	Gipps Land ...	The Commissioners	Similar in size, distribution, and uses to the preceding species.
Acacia longifolia, W. ...	...	Gipps Land ...	The Commissioners	Also similar in dimensions, uses, and range to the foregoing species. The wood is comparatively easily worked.
Acacia melanoxylon, Br. ...	Blackwood ...	Western Port ... Dandenong ... Ballaarat ... Gipps Land ... Victoria ... Port Phillip ...	J. McHaffie, Esq. ... The Commissioners Ballaarat Local Committee W. Buchanan, Esq. Messrs. Williams and Little Messrs. Anderson, Sharp, and Wright	Distributed over the greater part of the colony. A middle sized tree in open grassy valleys or ranges; a large timber-tree in the fern tree gullies throughout the southern and eastern part of the colony; the stem then often 80 feet long, without a limb, and of straight growth, with a diameter towards the base from 4 to 6 feet.
Acacia mollissima, W. ...	Wattle ...	Port Phillip ... Corner Inlet	The Commissioners	A small or middle sized tree, frequent in almost every part of the colony. The wood is useful for staves of casks.
Acacia penninervis, Sieb. ...	...	East Gipps Land	The Commissioners	A usually small tree, occurring in the eastern districts, chiefly in rocky places.
Acacia Riceana, Hensl. ...	...	Gipps Land ...	Dr. F. Mueller ...	A small tree, principally met with in the vicinity of Wilson's Promontory.
Acacia salicina, Lindl. ...	...	Murray ...	The Commissioners P. Beveridge, Esq.	A small tree, common in the north-west desert. The wood hard and heavy, of a

				fine shade, highly adapted for ornamental furnitnre.
Acacia sophoræ, Br. ...	...	Port Phillip Heads	The Commissioners	A dwarf tree, of universal distribution along the sandy coast.
Acacia verticillata, W. ...	...	Port Phillip Heads	The Commissioners	More a bush than a tree, occnrring almost everywhere in moist valleys. Wood useful for small turners' work.
Acacia sp.	...	Murray ...	W. Cole, Esq.	
Acmene floribunda, Cand....	Myrtle tree ...	Gipps Land ... Wilson's Promontory	The Commissioners	A splendid tree, with remarkably dark and shady foliage, attaining a height of 120 feet; stem several feet in diameter, in favorable localities. Not rare from Sealers' Cove to the eastern boundary of the colony, along rivers and glens.
Acronychia laurina, F. M....	...	Gipps Land ...	Isaac Buchanan, Esq.	A beautifnl tree, attaining a height of 60 feet; diameter of stem occasionally 1½ to 2 feet. Ranges scantily from Lake King to Cape Howe.
Alsophila Australis, Br. ...	Mountain Tree-fern	Dandenong ...	The Commissioners	On slopes of moist ranges with deep vegetable mould; often 20, sometimes 30 to 40, rarely 50 or even 60 feet high; abundant in most of the sonthern forest districts.
Angophora intermedia, Cav.	Spnrious Apple-tree	Gipps Land ...	The Commissioners	A middle sized, rarely a large sized shady tree; diameter of stem occasionally 3 feet. Restricted to the eastern part of Gipps Land.
Atherosperma moschatum, Lab.	Sassafras ...	Dandenong ...	The Commissioners	A middle sized strongly aromatic tree of great beauty; in some of the deep damp sonthern forest districts qnite abundant; for quality of wood and bark see jurors' report. The wood is not subject to bursting.

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DIVISION A.—TIMBER SPECIMENS—*continued.*

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
Banksia Australis, Br. ...	Honeysuckle ...	Ovens ... Ballaarat Dandenong	The Commissioners Messrs. Anderson, Sharp, and Wright	A small tree; in barren localities, common all over the colony.
Banksia integrifolia, L. ...	Coast-Honey-suckle	Port Phillip Heads	The Commissioners Messrs. Anderson, Sharp, and Wright	A middle sized tree, to be found only on the coast, especially eastward from Port Phillip.
Banksia serrata, L. ...	Heath-Honey-suckle	Gipps Land ...	The Commissioners	A middle or small sized tree, with always remarkably crooked stem, only to be found in the heaths of Gipps Land.
Bedfordia salicina, Cand. ...	Dogwood or Poker tree	Dandenong ...	The Commissioners	A small sized tree with slender stem and soft wood, to be found in shady valleys along watercourses principally in the southern parts of the colony.
Brachychiton populneum	Curryong ...	Ovens ...	The Ovens Local Committee	Stem often remarkably turgid; wood exceedingly soft, white, and mucilaginous; Scattered over ro ky localities along rivers towards the east and north-east frontiers. The fibre of the bark can be converted into cordage.
Bursaria spinosa, Car. ...	...	Portland ... Western Port ...	W. Allitt, Esq. ... John Rogers, Esq.	A small tree, frequent throughout the colony.
Callistemon salignus, Br. ...	Stonewood ...	Sealers' Cove ...	Dr. F. Mueller ...	A small tree, to be found sparingly only in Gipps Land; the wood can be employed for xylography.
Callitris cupressiformis, Vent.	Mountain Cypress Pine	Ovens ...	The Ovens Local Committee.	Attaining a height of 60 to 80 feet in favorable localities; always restricted to mountainous places, although de-

				scending to valleys; known from the Grampians, Ovens Ranges, and East Gipps Land.
Callitris verrucosa, Br. ...	Desert Cypress Pine	Mnrray ...	The Commissioners	A pyramidal tree, growing to the height of about 60 to 80 feet; rather frequent in some of the dry northern plains and in the sandy north-western desert.
		Murray ...	P. Beveridge, Esq.	
Cassinia laevis, Br. ...	...	Corner Inlet ...	The Commissioners	Very small tree, common in wet forest localities.
Casnarina cristata, Miq. ...	...	Murray ... Murray ...	The Commissioners P. Beveridge, Esq. W. Ross, Esq.	A middle sized tree, distributed over the dry plains and ridges, in the north and north-west parts of the colony.
Casuarina leptoclada, Miq.	River Sheoak	Gipps Land ...	F. M. Walker, Esq. Messrs. Anderson, Sharp, and Wright	On the grassy ridges and ranges in the southern part of the colony, a middle-sized tree; along the rivers on the south-eastern frontier of Gipps Land.
Casuarina quadrivalvis, Vent.	Sheoak ...	Ovens ... Port Phillip Heads	The Commissioners	A middle sized tree, rather common throughout the colony.
Coprosma micropylla, Cunn.	...	Portland ... Gipps Land ...	W. Allitt, Esq. ... The Commissioners	A small tree, abundant in wet valleys and along rivers.
Dicksonia antarctica, Lab.	Gully Tree Fern	Dandenong ... Ballaarat ...	The Commissioners Ballaarat Local Committee.	Abundant in the fern tree gullies, chiefly throughout the southern parts of the colony, attaining a height from 10 to 25 ft.
Dodonaea viscosa, L. ...	...	Portland ... Western Port ...	W. Allitt, Esq. ... T. Rogers.	A very small, often bushy tree, scattered over the whole colony.
Elaeocarpus cyaneus, Sims	...	Gipps Land ...	Dr. F. Mueller ...	A small or middle sized tree, ranging from Wilson's Promontory to the eastern frontiers of Gipps Land. Wood compared by artisans to ashwood.
Elaeocarpus holopetalus, F. Muell.	...	East Gipps Land	T. Weatherhead, Esq.	A noble tree, attaining the height of 120 feet, found only in ravines or rivers in East Gipps Land. Wood pale, fine-grained, exquisite for cabinet work.

DIVISION A.—TIMBER SPECIMENS—*continued.*

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
Eremophila longifolia, F. M.	...	Murray ...	The Commissioners	A small tree, peculiar to the northern and north-western desert.
Eremophila Mitchellii, Benth.	...	Murray ...	Dr. F. Mueller ...	A small tree, rare in the Murray desert.
Eucalyptus acervula, Sieber	...	Ovens ...	The Commissioners	A large tree, to be found in the north-east district.
Eucalyptus acmenoides, Sch.	Broad-leaved Box tree	Gipps Land ...	The Commissioners	A large tree, scattered over the eastern parts of Victoria.
Eucalyptus amygdalina, Lab.	Narrow-leaved Peppermint	Dandenong ...	The Commissioners	A middle, sometimes a large sized tree, occurring on most of the southern and eastern ranges, remarkable for the rich yield of volatile oil from its leaves.
Eucalyptus corymbosa, Sm.	Bloodwood ...	Gipps Land ...	The Commissioners	A large tree, nowhere found but near the south-eastern frontier of this colony.
Eucalyptus dealbata, Cunn.	Grey Box tree	Ovens ...	The Commissioners	A big tree, scattered over ridges and ranges of many districts of Victoria.
		Ballaarat		
		Bendigo ...	Rev. Dr. Backhaus	
		Mount Macedon	W. Robertson, Esq.	
Eucalyptus fissilis, F. M. ...	Messmate ...	Dandenong ...	The Commissioners	A large tree, occurring in less fertile mountain districts; in some places abundant.
Eucalyptus globulus, Lab.	Blue Gum tree	Ballaarat ...	...	A colossal tree, in glens very favorable to its development approaching occasionally to a height of 300 feet, with a proportionate width of the stem, the latter not rarely 150 feet long without a branch; abundant in many of the littoral ranges, occupying the slopes and valleys, extending also through humid forest tracts to
		Apollo Bay ...	Messrs. Anderson, Sharp, and Wright	
		Corner Inlet ...	W. Buchanan, Esq.	
		Victoria ...	W. Porter, Esq.	

				the Buffalo Ranges northward. Refer for information on this valuable wood to the jurors' reports.
Eucalyptus goniocalyx, F. M.	White Gum tree	Gipps Land ...	The Commissioners	A gigantic tree, of frequent occurrence in many of the moister ranges.
Eucalyptus Gunnii, J. Hook	Mountain White Gum tree	Dandenong ...	The Commissioners	A large tree, extending sometimes to the height of 200 feet, ascending copiously to the Alps, retaining gigantic dimensions up to elevations of 4000 feet, where it forms often the main timber of the forest, largely distributed over many mountain districts; on moist plains reduced to a middle sized tree.
Eucalyptus inophloia, F. M.	Mountain Ash	Gipps Land ... Dandenong ... Ovens ...	The Commissioners The Commissioners Ovens Local Committee	A large sized timber tree, common in many of the ranges, especially through the southern and eastern districts.
Eucalyptus leucoxylon, F. M.	...	Gipps Land ... Dandenong ...	The Commissioners The Commissioners	A good or even very large sized tree, especially noticed in the south-eastern and eastern ranges of the colony.
Eucalyptus obliqua, L'Herit (E. fabrorum, Schl.) ... (E. gigantea, J. Hook)	Stringybark ...	Ovens ... Gipps Land ... Ballaarat ...	The Commissioners The Commissioners Ballaarat Local Committee	Often a gigantic tree, seen not rarely from 150 to 200 feet high, in vast profusion extending over all the barren ranges of the colony.
Eucalyptus odorata, Schl. ...	Peppermint tree	Port Phillip Heads	The Commissioners	A usually middle sized tree, distributed over the more open park-like ridges, particularly of the southern districts.
Eucalyptus oleosa, F. M. ...	Mallee tree ...	Murray ... Murray ...	The Commissioners P. Beveridge, Esq.	A small tree, most copiously extending over the Murray desert, forming a large proportion of the Mallee scrub; the leaves rich in volatile oil. The roots of this tree spread horizontally, and retain water in such a quantity as to enable

Division A.—Timber Specimens—*continued.*

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
				travellers to obtain it for drinking in cases of need.
Eucalyptus persicifolia, Lodd.	Blackbut ...	Gipps Land ...	The Commissioners	A large tree from the forests of East Gipps Land.
Eucalyptus rostrata, Schlech.	Red Gum tree	Ovens ...	The Commissioners	A good sized, occasionally gigantic tree, lining the banks of rivers, especially in the less mountainous country, distributed over the greatest part of the colony. On the qualities of this wood, see juror's report.
		Dandenong ...	The Mnnicipality of St. Kilda	
		Ballaarat ...	Ballaarat Local Committee	
		Ovens ...	The Ovens Local Committee	
Eucalyptus sideroxylon, Cunn. (E. siderophloia, F. M.)	Ironbark tree	Ovens ...	The Commissioners	A middle or large size tree, chiefly on quartz ranges; frequent on many of the gold fields.
		Bendigo ...	Rev. Dr. Backhaus	
		Gipps Land ...	The Commissioners	
		Ballaarat ...	Ballaarat Local Committee	
		Bendigo ...	Messrs. Eddy and Raymond	
Eucalyptus viminalis, Lab.	Manna tree ...	Port Phillip ...	Dr. F. Mueller ...	Scattered extensively over rather open ridges and plains, impressing on them often a park-like appearance, attaining a height from 50 to 120 feet.
Eucalyptus Woollsii, F. M.	Woollybut ...	Gipps Land ...	The Commissioners	A tall tree, nowhere found in Victoria but in the most eastern parts of Gipps Land. A beautiful solid wood yet easily worked, and well adapted for furniture.
Eucalyptus (sp.)... ...	...	Ovens ...	The Commissioners	

Eucalyptus (sp.)... ...	...	Ovens		
Eucalyptus (sp.)... ...	Birds-eye wood	Ballaarat		
Eurybia argophylla, Cass....	Musk tree ...	Dandenong ...	The Commissioners	A small or middle sized tree, not rare in the forest valleys, especially of the southern districts. The leaves pervaded by a strong musk-like scent, which cannot however be obtained by distillation as an essential oil.
		Western Port		
		Ovens ...	Ovens Local Committee	
		Corner Inlet ...	The Commissioners	
		Mount Macedon	W. Robertson, Esq.	
Exocarpus cupressiformis, Lab.	Native Cherry tree	PortPhillip Heads	The Commissioners	A tree usually from 20 to 40 feet high, universally distributed over ridges and mountains of the country.
		Gipps Land ...	The Commissioners	
			Messrs. Anderson, Sharp, and Wright	
	Native Cherry tree	Ballaarat		
		Ovens ...	Ovens Local Committee	
Fabricia laevigata, Gaertn.	...	PortPhillip Heads	The Commissioners	A small tree, very abundant along the sandy shores.
Fagus Cunninghamii, Hook	EvergreenBeech	Gipps Land ...	...	A noble tree from 60 to 150 feet high, scattered along the deep forest glens, towards Cape Otway, in the Dandenong Ranges, at Sealers' Cove; but forming the principal timber of the subalpine forest on the Baw Baw Ranges, ascending to the height of 5000 feet, and there still retaining in sheltered places considerable dimensions.
Hakea stricta, F. M. ...	Water Hakea...	Murray ...	W. Roff, Esq. ...	A small tree. Its roots yielding water, like the Mallee.
Hedycarya pseudo-morus, F. M.	Spurious Mulberry tree	Gipps Land ...	The Commissioners	A small or middle sized tree, following the rivulets of our humid southern ranges; a comparatively soft wood of beautiful shade, quite available for cabinet work.
		Dandenong ...	The Commissioners	

Division A.—Timber Specimens—*continued.*

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
Lomatia Frazerii, Br. ...	...	Dandenong ... Gipps Land	The Commissioners	A tree under favorable circumstances reaching to the height of 80 feet, interspersed amongst other timber trees, chiefly in the fern tree gullies of the southern and eastern districts of Victoria. The wood tough and durable, serviceable for furniture.
Melaleuca amillaris, Sm. ...	...	Gipps Land ...	The Commissioners	A small tree, known in Victoria only from East Gipps Land.
Melaleuca curvifolia, Schl.	Coast tea tree	Port Phillip Heads Portland Western Port ...	The Commissioners J. Rogers, Esq.	A small or middle sized tree, observed not only along the coast tracts, but also in the subsaline desert parts of Victoria.
Melaleuca ericifolia, Sm. ...	...	Corner Inlet ...	The Commissioners	A small bushy tree, growing most abundantly in swamps of the southern and middle parts of Victoria, extending to the estuaries.
Melaleuca squarrosa, Sm.	...	Gipps Land ...	Dr. F. Mueller ...	A tree developed in morassy forest glens to the height of 80 feet, usually however small, the stem attaining a diameter of 2 feet to 3 feet, the bark consisting of innumerable friable papyraceous layers.
Monotoca elliptica, Benth...	...	Gipps Land ...	The Commissioners	In heathy coast tracts, not rare, never of large size, useful for tools.
Myoporum dulce, Benth. ...	...	Murray ...	The Commissioners	In the north-west desert not unfrequent, but gaining only inconsiderable dimensions of the stem.
Myoporum Cunninghamii, Bth.	...	Murray ...	The Commissioners	With the preceding species, and also but a small tree.
Myoporum insulare, Br. ...	...	Port Phillip Heads	The Commissioners	A middle size tree, in considerable quantity

				available in the marshes and sand tracts of the coast, also in the somewhat saline portions of the desert; over other parts of the colony but sparingly distributed.
Myoporum platycarpum, Br.	Sugar tree ...	Murray ... Murray ...	The Commissioners P. Beveridge, Esq.	A small tree, the wood seldom exceeding 1 foot in diameter, the bark exuding a saccharine secretion; dispersed over the north-west desert.
Myrsine variabilis, Br. ...	...	Dandenong ... Gipps Land ... Corner Inlet, and Western Port	The Commissioners The Commissioners The Commissioners S. Rogers, Esq.	Along the streams and rivulets of the southern forests, away from the ranges a shrub, on the mountains a small or even middle sized tree.
Notelaea ligustrina, Vent ...	Spurious olive	Dandenong ...	The Commissioners	A tree of small dimensions, seldom found elsewhere but on shady torrents in the southern portion of the colony.
Ozothamnus ferrugineus, Br.	...	Dandenong ... Gipps Land	The Commissioners	More a shrub than a tree, common in the southern and middle districts of Victoria.
Panax dendroides, F. M. ...	Ash panax ...	Gipps Land ...	The Commissioners	A small elegant tree, seldom exceeding 25 feet in height, often smaller; from the southernmost forest glens ascending to the Alps. Wood soft and pale.
Panax Murrayi, F. M. ...	Palm panax ...	East Gipps Land	The Commissioners	Only as yet found in the ravines near Mount Imlay, where this tree by its palm-like appearance forms an ornament in the landscape; the stem is remarkably straight and slender, advancing to the height of 80 feet; crowned by ramnifications and foliage very similar to those of Ailantus glandulosa. Wood pale and soft.
Persoonia linearis, Br. ...	...	Gipps Land ...	The Commissioners	A small crooked tree not extending westward of Gipps Land; singular for the scarious lamellæ of its red bark.

DIVISION A.—TIMBER SPECIMENS—*continued.*

Systematic Name.	Vernacular Name.	Locality.	Exhibitors.	Size, Range, and Qualities of the Species.
Pittosporum bicolor, Hook	...	Dandenong ...	The Commissiouers	A small or middle sized tree, of not rare occurrence in our southern forest valleys, priucipally where fern trees grow. Wood valuable for handles of implements.
Pittosporum phillyroidis, D. C.	...	Murray River ...	W. Ross, Esq. ...	A small tree, bitter in all its parts, yielding a gum similar to gum arabic. The tree is restricted to the desert tracks.
Pittosporum undulatum, Vent	...	Gipps Land ... Lake Wellingtou Coruer Inlet ... Western Port ...	The Commissioners Isaac Buchanan, Esq. The Commissioners S. Kidd, Esq.	A very umbrageous tree, available in some places of Gipps Land, extending also to Western Port, usually of not great size, but nevertheless, in a very rich soil and sheltered localities enlarged to the height of 80 feet. The wood is tough, but easily worked.
Pomaderris apetala, Lab. ...	...	Dandenong ... Western Port ...	The Commissioners S. Rogers, Esq.	Common along most of our rivers and their tributaries, especially towards or on the mountains, where it attains a height of from 40 to 50 feet. A soft useful wood of pale color, adapted for carvers aud tnrners' work.
Pomaderris elliptica, Lab....	...	Gipps Land ...	The Commissioners	Following the course of rivers, particularly within the mountaius, excelling seldom the preceding species in height, of less extensive distribution ; when away from the gullies reduced to shrubby growth.
Prostanthera lasiauthos, Lab.	Mint tree ...	Gipps Laud ...	The Commissioners	One of the most widely diffused trees of our ranges and river banks, varying where well developed from 30 to 60 feet

				in height; diameter of stem usually about 1 foot, exceptionally 2 feet. The wood hard and tough.
Santalum acuminatum, D. C.	Quandang ...	Murray ...	W. Ross, Esq ...	A small tree peculiar to the desert tracks, bearing an edible fruit, colonially called native peach. The kernel of the fruit edible, oily.
Santalum persicarium, F. M.	Sandal wood ...	Murray Desert	W. Ross, Esq ...	A small desert tree.
Xanthorrhoea Australis, Br.	Grass tree ...	...	... ...	In some heathy tracts extremely abundant; stems varying from a few feet to 10 feet in height, usually crooked, proportionately stout.

DIVISION B.—RESINS.

Name.	Exhibitors.	Remarks.
Resin of Eucalyptus amygdalina, Lab. (Narrow leaved Peppermint tree)	The Commissioners	All these Eucalyptus resins are largely and cheaply available; they are for their astringent properties employed in medicine, like kino and catechu, for technical uses see jurors' report.
Resin of Eucalyptus coriacea, Cunn. (Hill white gum tree)	C. E. Bird, Esq. ...	
Resin of Eucalyptus fissilis, F. M. (Messmate tree)	The Commissioners	
Resin of Eucalyptus globulus, Lab. (Blue gum tree)	The Commissioners	
Resin of Eucalyptus goniocalyx, F. M. (White gum tree)	The Commissioners	
Resin of Eucalyptus inophloia, F. M. (Mountain Ash)	The Commissioners	
Resin of Eucalyptus Gunnii, J. Hook. (Mountain white gum tree)	The Commissioners	

DIVISION B.—RESINS—*continued.*

Name.	Exhibitors.	Remarks.
Resin of Eucalyptus obliqua, L'Her. (Stringybark tree)	W. Daintree, Esq.	
Resin of Eucalyptus obliqua, L'Her. (Stringybark tree)	C. E. Bird, Esq.	
Resin of Eucalyptus odorata, Schl. (Peppermint tree)	The Commissioners	
Resin of Eucalyptus sideroxylon, Cunn. (Ironbark tree)	G. Fletcher, Esq.	
Resin of Eucalyptus viminalis, Lab. (Manna tree)	G. Harris, Esq. ...	The resin of Eucalyptus viminalis, or the manna tree, is exhibited in its fresh and decomposed state. In the latter case it furnished a real pigment, see jurors' report.
Resin of Eucalyptus viminalis, Lab. (Manna tree)	The Commissioners	
Resin of Eucalyptus viminalis, Lab. (Manna tree)	C. E. Bird, Esq.	
Resin of Eucalyptus corymbosa, Sm. (Bloodwood)	F. M. Walker, Esq.	Obtainable in East Gipps Land. One sample in a liquid state, another indurated.
Resin of Eucalyptus pusuifolia, Lodd. (Blackbut)	F. M. Walker, Esq.	From East Gipps Land. Sample in a liquid state.
Resin of Angophora intermedia, Cav. (Spurious apple tree)	The Commissioners	
Resin of Callitris verrucosa, Br. (Desert pine) ...	Lockhart Morton, Esq.	Resembles the Sandarac of the Mediterranean Callitris quadrivalvis. See jurors' report.
Resin of Xanthorrhœa Australis, Br. (Grass tree)	D. Connor, Esq.	
Resin of Xanthorrhœa Australis, Br. (Grass tree)	Dr. F. Mueller	
Resin of Xanthorrhœa Australis, Br. (Grass tree)	Dr. Robertson	
Resin of Xanthorrhœa Australis, Br. (Grass tree)	C. Tyers, Esq.	
Varnish made of gum kauri dissolved in essential oil of Eucalyptus amygdalina, Lab.	Josh. Bosisto, Esq.	See jurors' report.
Varnish made of resin and essential oil of Eucalyptus amygdalina, Lab.	Josh. Bosisto, Esq.	

DIVISION C.—GUM.

Name.	Exhibitors.	Remarks.
Gum of Acacia homalophylla, A. C. (the Myall tree)	W. Cole, Esq. ...	Copiously available during the summer season; less readily and completely soluble than gum arabic, retaining some astringency; otherwise similar to gum arabic.
Gum of Acacia mollissima, W. (the Wattle tree)	Dr. F. Mueller	
Gum of Acacia pyonantha, Benth.	Dr. F. Mueller	

DIVISION D.—BARK.

Name.	Exhibitors.	Remarks.
Bark of Eucalyptus obliqua, L'Her. (Stringybark)	The Commissioners	Used for thatching.
Bark of Eucalyptus inophloia, F.M. (Mountain ash)	The Commissioners	Used for thatching.
Bark of Eucalyptus Gunnii, Hook.	The Commissioners	Used for thatching.
Bark of Atherosperma moschatum, Lab. (Sassafras)	Dr. F. Mueller ...	Extensively available in many of the southern parts of the colony, in mountain recesses.
Bark of Acacia mollissima, W. (Wattle) ...	Thos. Lambert, Esq.	In vast abundance available in many parts of the colony, and extensively employed in tanning.
Bark of Acacia dealbata, Link	Thos. Lambert, Esq.	
Bark of Acacia pyenartha, Benth	Thos. Lambert, Esq.	
Bark of Pimelea axiflora, F. Mueller	E. W. Gladman, Esq.	Common in many of the forests of our ranges, along the irrigated valleys. The bark is very tenacious.

DIVISION E.—FIBRE.

Name.	Exhibitors.	Remarks.
Fibres of Cryptostemma calendulacenm, Br. ...	— Hayter, Esq. ...	This fibre is obtained from the seeds of a South African herb which has invaded a great extent of this country.
Fibres of Cyperus vaginatus, Br., worked up into a net	J. Mackenzie, Esq.	This sedge is obtainable in the greatest abundance on flats subject to occasional inundation, also along water-courses, especially along the Murray River and its tributaries. The fish-nets made of it are the work of aborigines of the Murray tribe.
Fibres of Linum marginale, Cunn.	Edw. Bappman ...	The Australian perennial flax, yielding this fibre, is not unfrequent in the colony of Victoria.
Fibres of Linum marginale, Cunn.	The Commissioners	
Fibres of Linum marginale, Cunn.	T. W. Murphy, Esq.	
Fibres of Linum marginale, Cunn.	Josiah Mitchell, Esq.	
Fibres of Linum marginale, Cunn., worked up in nets	H. Hopwood, Esq ... P. Beveridge, Esq.	The net manufactured by natives of the Murray tribe.
Fibres of Pimelea axiflora, F. M.	Dr. F. Mueller ...	In great quantities obtainable in many of our ranges.
Fibres of Sida pulchella, Bonpl.	Dr. F. Mueller ...	In very large masses to be collected along watercourses, as well in flat as in mountainous country, through a great portion of the colony.

DIVISION F.—DISTILLED OILS.

Name.	Exhibitors.	Remarks.
Oil of Atherosperma moschatum, Lab. ...	Josh. Bosisto, Esq.	These oils are distilled from material furnished by Dr. F. Mueller. The material for the Eucalyptus Oils is in the vastest quantities obtainable throughout the whole coun-
Oil of Eriostemon squameus, Lab.	Josh. Bosisto, Esq.	
Oil of Correa speciosa, Andr.	Josh. Bosisto, Esq.	

Oil of Eucalyptus amygdalina, Lab.	Josh. Bosisto, Esq.	try, although for the respective kinds often only in certain
Oil of Eucalyptus corymbosa, Sm.	Josh. Bosisto, Esq.	districts. On the proportionate yield of oil, its qualities,
Oil of Eucalyptus fissilis, F. M.	Josh. Bosisto, Esq.	and the important uses to which they may be applied,
Oil of Eucalyptus globulus, Lab.	Josh. Bosisto, Esq.	see the jurors' report.
Oil of Eucalyptus goniocalyx, F. M.	Josh. Bosisto, Esq.	
Oil of Eucalyptus obliqua, L'Her. (fabrorum Schl.)	Josh. Bosisto, Esq.	
Oil of Eucalyptus odorata, Schl.	Josh. Bosisto, Esq.	
Oil of Eucalyptus oleosa, F. M.	Josh. Bosisto, Esq.	Leaves in vast quantity available in the Mallee scrub.
Oil of Eucalyptus coriacea, Cunn.	W. Johnson, Esq. ...	Leaves from the Buffalo Ranges.
Oil of Eucalyptus persicifolia, Lodd.	Josh. Bosisto, Esq.	Leaves from East Gipps Land.
Oil of Eucalyptus rostrata, Schl.	Josh. Bosisto, Esq.	
Oil of Eucalyptus viminalis, Lab.	W. Johnson, Esq.	
Oil of Melaleuca ericifolia, Sm.	Josh. Bosisto, Esq.	The material in enormous quantities obtainable in most
Oil of Melaleuca ericifolia, Sm.	W. Johnson, Esq.	parts of the colony.
Oil of Melaleuca uncinata, Br.	W. Johnson, Esq.	Leaves obtained from the Murray desert.
Oil of Melaleuca Wilsoni, F. M.	Josh. Bosisto, Esq.	The material available towards Lake Hindmarsh.
Oil of Melaleuca curvifolia, Schl.	W. Johnson, Esq.	The material largely obtainable in the Murray desert, and also on the coast.
Oil of Melaleuca genistifolia, Sm.	Josh. Bosisto, Esq.	Leaves from East Gipps Land.
Oil of Melaleuca linacifolia, Sm.	Josh. Bosisto, Esq.	Leaves from East Gipps Land.
Oil of Mentha Australis, Br.	Josh. Bosisto, Esq.	The Australian mint can be gathered in unlimited quan-
Oil of Mentha Australis, Br.	W. Johnson, Esq.	tities along most of the rivers of Victoria.
Oil of Mentha gracilis, Br.	Josh. Bosisto, Esq.	M. gracilis grandiflora and saturejoides occur in many
Oil of Mentha grandiflora, Bth.	Josh. Bosisto, Esq.	parts of the colony.
Oil of Mentha saturejoides, Br.	Josh. Bosisto, Esq.	
Oil of Pittosporum undulatum, Vent.	Josh. Bosisto, Esq.	The flowers from which this oil was obtained can hardly be collected remuneratively in the ranges, but the tree may be cultivated with great facility and furnishes a profusion of flowers of an almost jasmine-like scent, desirable for distillation.

Division F.—Distilled Oils—*continued.*

Name.	Exhibitors.	Remarks.
Oil of Prostanthera lasianthos, Lab.	Josh. Bosisto, Esq.	Abundant quantities of leaves are available in most of the ranges along rivers.
Oil of Prostanthera rotundifolia, Br.	Josh. Bosisto, Esq.	Leaves obtainable in the ranges of Gipps Land.
Oil of Zieria arborescens, Br.	Josh. Bosisto, Esq.	The supply of Zieria leaves is abundant only in some of the forest valleys.

Note.—The case for holding these oils made of Blackwood.

DIVISION H.—NATIVE WEAPONS AND IMPLEMENTS.

Name.	Exhibitors.	Remarks.
Axe, used by the Murray tribe	M. Foster, Esq.	
Collection of native weapons	H. Jamieson, Esq.	
Collection of native weapons	The Commissioners	
Collection of native weapons	W. T. N. Champ, Esq.	
Collection of native weapons	Peter Beveridge, Esq.	
Tirlwoork and Tarnuck	Will. Thomas, Esq.	The former used for procuring fire, the latter for carrying water.
Baskets made of sedge	R. Chirnside, Esq.	

DIVISION I.—ARTICLES MADE OF INDIGENOUS WOODS.

Name.	Exhibitors.	Remarks.
Chessboard and figures	The Commissioners	Each square and each figure illustrating a different species of wood, botanically named in an accompanying index.
Chessboard and figures	W.T.N.Champ, Esq.	
Fire-screens	W.T.N.Champ, Esq.	
Flower-stands	W.T N.Champ, Esq.	
Wood specimens in book form, designed by Dr. F. Mueller, the frame of New South Wales Cedar (Cedrela Australis); the veneer made of the wood named on the respective back titles	W.T.N.Champ, Esq.	
Wood specimens in book form, designed by Dr. F. Mueller, made entirely of the kind of wood which the back title designates	W. Madden, Esq.	
Fellies and bows of Blackwood (Acacia melanoxylon) and Red Gum (Eucalyptus rostrata)	John Perry, Esq.	
Bows and shafts of Blackwood (Acacia melanoxylon)	— Jackson, Esq., Ballaarat	
Blackwood (Acacia melanoxylon) bent by steam	F. Goernemann	
Gun stocks of Blackwood (Acacia melanoxylon) and Sheoak (Casuarina quadri valvis)	— Hanson, Esq.	
Fifty paper knives made of as many different kinds of Victorian woods, all botanically signed	The Commissioners	
Pipes of Myall wood (Acacia homalophylla) ...	C. Arnold, Esq.	
Pipes of Myall wood (Acacia homalophylla) ...	W.T.N.Champ, Esq.	
Walking sticks	W.T.N.Champ, Esq.	
Palings of Eucalyptus	Messrs. Scott and Boyd	
Staves of Wattles (Acacia mollissima)	The Commissioners	

Division I.—Articles made of Indigenous Woods—*continued.*

Name.	Exhibitors.	Remarks.
Shingles of Eucalyptus, from Ballaarat	Smith Brothers	
Whip handle of Myall wood	Rev. Jos. Docker	
Work table of Native woods	W. T. N. Champ	
Work table of Native woods	Robt. Gruber, Ovens	
Work table of Native woods	Yarra Bend Asylum	
Ornamental frame of Red Gum (Encalyptus rostrata) and Blackwood (Acacia melanoxylon)	The Commissioners	
Twelve sorts Colonial Timber	Ballaarat Local Committee	
Coachbuilder's Boards	Messrs. Corroran Brothers, Bullarook	
Spokes of Blue Gum and Ironbark wood ...	J. Perry, Esq.	
Felloes of White Gum, Blue Gum, and Red Gum	J. Perry, Esq.	
Blackwood rims	J. Perry, Esq.	
Blackwood rims	Ballaarat Local Committee.	

DIVISION K.—MISCELLANEOUS ARTICLES.

Name.	Exhibitors.	Remarks.
Extract of Atherosperma bark	Josh. Bosisto, Esq.	Medicinally used.
Extract of Atherosperma leaves	Josh. Bosisto, Esq.	Medicinally used.
Specimen of Sarcophycus potatorum, Kuetz. ...	J. McHaffie, Esq. ...	This huge alga is often ejected by the sea along our coast, where the specimens frequently attain a size several

		times greater than that exhibited, their weight when fresh varying from several cwt. to half a ton. With many other of our algæ it might advantageously be used for the manufactnre of an iodinous kelp.
Specimen of Mylitta Australis, Berk.	Dr. T. Evans ...	A subterranean fungus, occasionally ploughed up; by boiling, it is rendered available for food.
Specimen of Mylitta Australis, Berk.	F. Murray. Esq.	
Dried Fruit of Quandang (Santalum acuminatum, D. C.)	— Stanbridge, Esq.	The sandal fruit is of agreeable acidulous taste, and usually every alternate year richly produced. The tree inhabits exclusively the north-west desert.
Jam of Quandang	W. Cole, Esq.	
Nardoo Fruit and Flour	Exploration Committee	Sporangia of Marsilea quadrifolia L. var hirsuta, abundant in many depressed places subject to inundations, especially on the Murray River and its lower tributaries; cakes are prepared from the pounded sporangia by the natives.
Cabbage-tree Leaves, manufactured	W. T. N. Champ, Esq.	The material for the cabbage-tree hats is furnished by the imperfectly expanded leaf of Corypha Australis, Br., which palm occurs in Victoria only near the entrance of the Snowy River.
Cabbage-tree Nnts	Dr. F. Mueller	
Box with Native Lichens	Dr. F. Mueller ...	The box made of the wood of Banksia serrata.
Potash prepared from the ashes of Fern trees ...	W. Gladman, Esq., and J. Kruse, Esq.	
Vinegar made of White Gum leaves	J. Gray, Esq.	
Dried Plants collected near Castlemaine ...	R. I. Kendall, Esq.	
Crystals of Soda	W. T. Beal, Esq.	
Australian Manna	Josh. Bosisto, Esq.	Exudes and drops from the younger branches of the manna tree (Eucalyptus viminalis, Labill), during the warmer months of the year, and may be collected in considerable quantity, the tree occurring as well on plains as on ridges in the colony.
Dying Material	— Chuck, Esq.	

94. Adamson, M. A. and H. J., Australasian Hotel, Queenscliff.—2 Seaweed Boxes, Basket Polyzoa Collected at the Heads. *Ex.*

95. Arnold, C.—Chessboard and Figures, of Colonial Woods, Paper-knives made of the same.

96. Baxter, Ann, Lothian-street, Hotham.—Australian Seaweed and other Marine Products; 10 Pictures and 2 Vases. *Des.*

97. Beal, Ann, Cecil-place, Emerald Hill.—Marine Bouquet. *Des.*

98. Chuck, T., Octavia-street, St. Kilda.—Fibre, Paper Material, Cotton, and Cotton Seeds. *Ex.*

99. Dean, W., Queenscliff.—Frames of Colonial Wood, containing Seaweeds arranged by Exhibitor, who is deaf and dumb. *Des.*

100. De Castella and Anderson, Messrs., 127 Flinders-lane, Melbourne.—Turf or Peat from Yering. *Ex.*

101. Draper, T. J., 83 Great Bourke-street west, Melbourne.—Coffee Table of Native Blackwood, with inlaid top. *Ma.*

102. Foord, G., Elizabeth-street, Melbourne.—Nest of the Mud Wasp. *Ex.*

103. Gray, H., Ballaarat.—Sample of Oil of the Eu Amygdalina, and Residual Products of the destructive distillation of the Eu Gunii. *Ma.*

104. Her Majesty Mary, Queen Dowager of the Bacchus Marsh and Melton Tribe of Natives.—Baskets made from Victorian Grass in her leisure hours. *Ma.*

105. Holdsworth, ——, Sandhurst.—Sample of Pyroxylic Spirit. *Ma.*

106. Levy Brothers, Messrs., Melbourne.—One plank of Myall Wood. Acacia Homolophylla. All. Cunn. *Ex.*

107. Levitt, S. S., High-street, St. Kilda.—Picture composed of Seaweed. *Ex.*

108. Mears, P. J., Chewton.—Fibre and Seed of Plant (called here Cotton) growing in pods. *Ex.*

109. Mercer, Mrs. G., 8 Malop-street, Geelong.—Seaweed in Leather Frame. *Des. and Ma.*

110. Mueller, Dr., Botanical Gardens, Melbourne.—Wire and Leather Covers for drying plants; box containing Native Lichens, Bark of Sassafras, Atherospermum moschatum, and Acacia (wattle) bark; collection of Native Grasses.

111. Murphy, T. W., Muckleford, Castlemaine.—Sample of Native Flax, growing wild. *Ex.*

112. Murray, F., Lancefield, Five-mile Creek.—Native Bread. *Ex.*

113. Praagst, G. W., Williamstown.—The Residue from Wood, Leaves, &c., obtained in the manufacture of Vegetable Gas. *Pa.*

114. Sandhurst Local Committee.—Specimens of Timber from that locality. *Ex.*

115. Simpson, G.—Specimens of Grass Tree from Mountain Rush. *Ex.*

116. Siville, J. J.—Seaweeds. *Ex.*

117. Watson, A. R., Armstrong-street, Ballaarat.—Specimens of Bullarook Timber, District of Ballaarat—White Gum, Wattle, Honeysuckle, Cherry, Ironbark, Box, Musk, Stringybark, Blue Gum and Lightwood. *Ex.*

118. Watts, H., Warrnambool.—Specimens of Microscopic Objects and Seaweed. *Ex.*

119. White, W. and G., Williamstown.—6 specimens of Timber used in Shipbuilding. *Ex.*

120. Wood, William, 116 Smith-street, Collingwood.—Seaweed, Insects, Birds, Animals, and Reptiles, Shell Work, and Shell Flowers, 8 cases. *Des. S.*

CLASS IV.

MINERAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

COMMITTEE:

THE HON. JOHN BASSON HUMFFRAY, Esq., M.P.
PROFESSOR McCOY.
ALFRED RICHARD CECIL SELWYN, Esq.

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121. ABEL, A. F., Ballaarat. — Collection of Minerals and Meteoric Iron. *Ex.*

122. BACK CREEK COMMITTEE.—2 packets Petrified Wood, from Rocky Flat, found 100 feet below the surface; 1 packet Crystals; 1 packet Stones, from Scandinavian Lead; 1 packet Quartz, with Ironstone cemented. *Ex.*

123. BANK OF AUSTRALASIA, Melbourne.—Samples showing the Varieties of Gold obtained on the different Gold Fields; cake of Gold, 1015 ozs., value £3850. *Ex.*

124. BANK, ENGLISH AND SCOTTISH, Melbourne.—Gold Specimens. *Ex.*

125. BANK, COLONIAL, Melbourne.—Gold Specimens. *Ex.*

126. BANK, NEW SOUTH WALES, Melbourne.—Gold in Quartz, Nuggets, and Alluvial Gold, from the various Gold Fields. *Ex.*

127. BANK, ORIENTAL, Melbourne.—Quartz Specimens from Oriental Reef, Morse's Creek. *Ex.*

128. BANK OF VICTORIA.—Gold Specimens. *Ex.*

129. BARKLY, HIS EXCELLENCY SIR H.—Specimen of Meteoric Iron from Western Port, and Horse Shoe made therefrom. *Ex.*

130. BATES, W., Melbourne.—The largest Colonial Diamond yet discovered. *Ex.*

131. BEECHWORTH LOCAL COMMITTEE.—Sample of Granite. *Ex.*

132. BENYON, ——, Esq.—Gold Specimens. *Ex.*

133. BLIGH AND HARBOTTLE, 21 Queen-street, Melbourne.—Ore of Antimony. *Ex.*

134. BRUSH AND McDONNELL, Melbourne.—"Argus" Prize Gold Cup. *Ma.*

134*a*. BREADING, P. G., Barker-street, Castlemaine.—Graptolite. *Pro.*

135. BURKITT, A. H., Beechworth.—Analyses of Black Sand, Gold, &c., in proportionate divisions, from the Middle Woolshed, Ovens District. *Ex.*

136. CAKEBREAD, G., Limeburners' Point, Geelong.—Limestone. *Ex.*

137. CAMPBELL, ——, Back Creek.—Small Quartz Crystals impregnated with ironstone; two translucent Stones, names unknown. *Ex.*

138. CASTLEMAINE COMMITTEE.—Building Stones, Flags, Bricks, Slates, &c. *Ex.*

139. CAPE PATTERSON COAL COMPANY.—Sample of Coals. *Pro.*

140. CATHERINE REEF UNITED CLAIMHOLDERS COMPANY.—Quartz Specimens and Tailings. *Ex.*

141. CAWKWELL, HENRY A., High-street, Gardiner.—Agricultural Drain Pipes, Flooring Tiles, Gutter Bricks and Tiles; Gothic Terra Cotta Tracery Window Architrave. *Ma.*

142. CLARKE, W. J., Swanston-street.—Flower Vase, earthenware, 24 in. diameter.

143. CLARKE AND SON, MESSRS., Elizabeth-street, Melbourne.—Specimens from Ajax and Newman's Reef. *Ex.*

144. COLLES, J., Back Creek.—Fossils and Volcanic Remains from Mount Greenock, an extinct volcano. *Ex.*

145. COMMISSIONERS OF THE EXHIBITION.—A Pyramid 44 ft. 9¼ in. high, and 10 ft. square at its base, representing the quantity of Gold exported from Victoria from the 1st October, 1851, to the 1st October, 1861, viz., 26,162,432 oz. Troy, equal to 1,793,995 lbs. Avoirdupois, or 800 tons 17 cwt. 3 qrs. 7 lbs.; equal in solid measurement to 1,492½ cubic feet; of the value of £104,649,728 sterling. Designed by J. G. Knight, F.R.I.B.A., agent to the Commissioners of the Victorian Exhibition; executed by T. Riley, Decorator, Lonsdale-street, Melbourne.

146. COOP, JAMES, 28 Little Collins-street west.—Lead Piping. *Ma.*

147. COTOWORTH, GEO., AND CO., Morse's Creek, Ovens River.—Gold in Quartz, a Specimen found 68 feet from surface; Gold in Quartz after being Burned, prior to being Crushed; Gold in Honeycombed Quartz. *Ex.*

148. D'ARCY, MR.—Rock Crystals, from Heathcote, at a depth of 120 feet. *Ex.*

149. DOWNE, W. B., Castlemaine.—Block of Freestone, dressed, from local quarry; Samples of Pressed Bricks; Samples of common Stock Bricks, from Barker's Creek. *Pro.*

150. DYER AND CO., MESSRS., 7 Queen-street, Melbourne.—Geelong Limestone; Point Nepean ditto. *Ex.*

151. EMERY, M., Preston.—Assorted Pottery and Drain Pipes. *Ma.*

152. FERGUSON AND URIE.—Copper Wire Rope, Lightning Conductor. *Ma.*

153. FOORD, G., Elizabeth-street, Melbourne.—Meteoric Iron, from Cranbourne, showing the structure, and case of Minerals associated with Gold. *Ex.*

154. GARDINER, THOMAS, Town Clerk, Maryborough.—Box containing various Mineral Specimens; Barrel containing Quartz, Limestone, &c. *Ma.*

155. GEORGE, J., Brunswick.—Fossil Rib Bone. *Ex.*

156. GIBBONS, W. S., Collins-street east, Melbourne.—Australian Soils and Cement Stones, with their Analyses. *Ex.*

157. GRAY, W., Brunswick.—Bricks and Tiles. *Ma.*

158. GREEN, P. J., Castlemaine.—Fossil Graptolite. *Ex.*

159. HALL, J., Emerald Hill.—Iron Ore from Sandhurst. Ore Calcined, Slag. The first pig iron smelted in Victoria. *Ex.*

160. HIRSCHI, F., Barker-street, Castlemaine.—2 large Garden Vases and 1 Urn of Unglazed Earthenware; 1 barrel of Glazed Earthenware. 4 Porous Cells and Insulators for Telegraphic uses. 1 Porous Water-bottle; and 3 samples of Clay. *Des. Inv. and Ma.*

161. HODGES, J. J.—Hexagon and Octagon Tiles. *Ma.*

162. HODGKINSON, W., Chapel-street, Prahran. — Bricks and Tiles. *Ma.*

163. INDEPENDENT MINING COMPANY, Back Creek.—Strata from company's claim, Rocky Flat. *Ex.*

164. INGLEWOOD LOCAL COMMITTEE.—Collection of Specimens. *Ex.*

165. KELLY, T., Brunswick.—12 in. and 4 in. Drain Pipes, made at Brunswick. *Ma.*

166. KER, R.—Block of Red Granite from Western Port. *Ex.*

167. KITTO, P. R. L. M., Fryer's Creek.—Iron Ore, producing 70 per cent. *Pro.*

168. KNIGHT, J. G., Westbourne-terrace, St. Kilda.—Samples of Building Stone, Bricks, Tiles, Slate, and Timber, the produce of this colony. *Ex.*

169. LAIDLAW AND PARTY, Maxwell Reef.—Specimens of Gold and Quartz. *Ex.*

170. LAWSON, W., Collins-street west, Melbourne.—Salt, fine and coarse, from the water of Hobson's Bay. *Ma.*

171. LEICESTER, C., 154 Flinders-lane east.—Case of Auriferous and Metallic Quartz, and New Patent Blasting Powder. *Pat. Ma.*

172. LEWIS, J. J., Whroo.—Gold Specimens. *Ex.*

173. MALAKHOFF COMPANY, Steiglitz.—Samples of Auriferous Sulphides. *Ex.*

174. MACDONALD, KENNETH, Salt Works, near Wyckliffe.—1 bottle of fine salt, 1 bottle of coarse salt, 1 bottle of salt in its natural state, 1 bottle of water taken from Lake Bolac, near Wyckliffe. *Ma. and Ex.*

175. MCCRAE, ——, Little Collins-street east.—Colonial Amethyst, set and cut in the colony. *Ex.*

176. MITCHELL, A., Avoca.—Gold Specimens. *Ex.*

177. Morgan, J. R., Back Creek.—Strata from Quartz Reefs, Alluvial Strata, Petrified Wood, Collection of Crystals, Casting Sand. *Ex.*

178. Moss, W., 8 Bignell's-lane, Melbourne.—Asphalt. *Ma.*

179. Murphy and Leplastrier, Messrs., Melbourne.—Sample of Iron Ore. *Ex.*

180. Newlands, Thos., Hotham.—Diamond. *Ex.*

181. Nuggety Mining Company, Campbell's Creek, Castlemaine.—Quartz with Gold; one week's prodnce. *Pro.*

182. Nutt, J., 131 Johnston-street, Fitzroy.—Specimens of Gold and Auriferons Quartz. *Ex.*

183. O'Meara, M., Hargreaves-street, Castlemaine.—Specimen of Mundic and other Metals in Quartz, and Slate or Soap Stone. *Pro.*

184. Ovens Local Exhibition Committee.—Specimens of Gold and Auriferous Quartz from various reefs and creeks in the Ovens District, contributed by Messrs. Chalmers and Gitchell; 2. Specimens of Auriferous Quartz, Black Sand (Tin Ore), Smelted Block Tin, Crystals, and Manufactured Jewellery, contributed by Mr. Jameson Turner; 3. Granite and Building Stones, by the Municipality; 4. Slate Slabs, by Mr. John Stevens. *Ex.*

185. Perkins, Horace, Castlemaine.—Quartz Crystals, Lead in Quartz, Fossil Graptolite, Mundic in Quartz and Slate. *Pro.*

186. Phillipson, J., Emerald Hill.—3 cases Mineral Spars from England. *Ex.*

187. Polkinghorne, James.—Specimens of Antimony, crude and in bars; Tin, Black Sand, Lime, Oxide of Calcium, manufactured from sand obtained close to the sea at Williamstown. *Ex.*

188. Poole, A., Castlemaine.—Fossil found at Talbot Quarries. *Pro.*

189. Preshaw, W. J., Castlemaine.—Crystal Quartz, Water-worn Stone, &c. *Pro.*

190. Rangier, V.—Glazed Earthenware. *Ma.*

191. Reid, David, Hermitage, Barnawatha.—Collection of Jewellery and Precious Stones from Reid's Creek, Ovens. *Ex.*

192. Rigby, E.—1 bottle of Black Sand. *Ex.*

193. Roberts and Jones, Specimen Gully, Castlemaine.—Slab of Slate Stone for Paving, the blocks ranging in thickness from 1 inch to 3 inches, and in dimensions from 6 to 10 feet square; block of Mount Alexander Granite. *Ex.*

194. Robertson, J. S., Inglewood.—Collection of Mineral Specimens. *Ex.*

195. Rodda, R. V., Port Phillip Club Hotel.—Minerals and Metals operated upon by Patent Process. *Ex.*

196. Ryland, P. G. B., Castlemaine.—Specimens of Crystals. *Pro.*

197. Sandhurst Local Committee.—Sample of Granite. *Ex.*

198. St. Mungo Quartz Company.—Specimens of Quartz and Gold. *Ex.*

199. Selwyn, Alfred R. C., Government Geologist.—Geological Maps and Geological Mineral Specimens. *Ex.*

200. Scott and Boyd, Back Creek.—Limestone. *Ex.*

201. Shanklin, R., Melbourne.—Marbles, Sienite, &c. *Ex.*

202. Smith, A. K., Melbourne.—Specimen Stone dressed by Machinery.

203. Tuckett, ——, Bet Bet.—Sample of Limestone from Bet Bet. *Ex.*

204. Vaughan and Ferrons' Reef Company, Castlemaine.—Oxide of Iron and large Crystal. *Ex.*

205. Victorian Coal Company (Levy and Son).—Sample of Coals. *Ex.*

206. Victorian Kaolin Company, 29 Flinders-lane west (Works at Bulla Bulla).—1 large block Kaolin, in natural state; 1 small ditto; 1 piece ditto ditto, vein running through; 1 large block washed Kaolin; 2 pieces Ochre, in natural state; 1 case containing two sorts Blue; 1 ditto ditto; 3 ditto Kaolin Cakes, for various purposes; 3 blocks Imitation Marble from Kaolin; 1 bottle melted Crystal, 1 bottle Putty Kaolin, 1 ditto Whiting, 2 ditto Crayons, 1 ditto Bulla Ochre, 1 ditto Pink ditto, 1 ditto Chrome Yellow, 1 ditto Azure Blue, 1 ditto Kaolin and Crystal crushed, 1 ditto Crystal alone, pnl.; 1 ditto Kaolin sep. from Crystals; 1 ditto pnre Crystals from Kaolin; 1 piece Cement, 1 piece Terra Cotta, 1 ditto Soft Stone coated with Silicate Paint.

207. Victorian Reef Gold Mining Company, Bendigo.—Modelled Section of a Gold Mine. *Ex.*

208. Wait, ——.—Specimen of Gold in Quantity, taken from near the surface at Sandhurst. *Ex.*

209. Walshe, B., Heathcote.—Antimony Ore, and Jasperoid Conglomerate. *Ex.*

210. Watson, J. F., Back Creek.—Iron Ore. *Ex.*

211. Wheeler, D. D.—Specimen of Gold and Quartz from the New Zealand Gold Fields. *Ex.*

212. Wilkinson, R. W., Back Creek.—Geological Specimens and Precions Stones. *Ex.*

213. Wright, G., Inglewood.—Collection of Specimens from Colnmbian Reef. *Ex.*

214. Young, J., Melbourne.—Pedestal for Font, carved in Caen Stone. *Ma.*

215. Young, Richie, Doveton-street, Castlemaine.—Specimens of Crystals; also, specimen of an unknown Mineral found in bluestone. *Pro.*

CLASS V.

MACHINERY, INSTRUMENTS, TOOLS, AND IMPLEMENTS.

COMMITTEE:

THE HON. JOHN BASSON HUMFFRAY, ESQ., M.P.
PROFESSOR MCCOY.
ALFRED RICHARD CECIL SELWYN, ESQ.

216. ACHESON, F.—Patent Endless Railway. *Ma.*

217. ACKRILL AND CO., Carron Timber Yard, Melbourne.—Patent Firing Bricks, with Wood Keys, for securely attaching joiners' work to walls, buildings, &c. *Inv. and Ma.*

218. AKERLEY, W. J., 208½ Little Collins-street.—Models of Ships. *Ma.*

219. ANDREW AND EDGAR, MESSRS.—Model of a Clipper Ship. *Ma.*

220. ANDERSON, R., 137 Little Collins-street east.—2 Brass Models of Garrison Guns, Rosewood Carriages. Model of Full-rigged Ship. *Ma.*

221. ANDERSON, SHARP, AND WRIGHT, Carron Timber Yard.—Doors, Windows, Chimney Pieces, Mouldings, Turnery, Architraves, &c. *Ma.*

222. APPLETON, H., 28 King-street, Melbourne.—Model of Stone-breaking Machine, Quartz Mill, and Hydraulic Pump. *Inv. and Ma.*

223. ATHENS, J. H., 118 Stephen-street, Melbourne —Self-heating Flat Irons. *Des. Inv. and Pat.*

224. BOBARDT, OTTO, 131 King-street, Melbourne.—Beam-Compass, Brass Parallel Ruler, Prism Cross. Patent Puddling Machine, with Planetary motion. *Ma.* (*Inv.* by B. Frantel). Patent Embossing Press. *Inv. and Ma.*

225. BLAZEY, W. R., Bridge-road, Richmond.—Piano Forte of Colonial Woods. *Des. Ma.*

226. BOLTON, JONATHAN, Osborne-street, Williamstown. — Signal Lamp, Circulating Table. The use of this Lamp is to supply communication by night, where there is no electric telegraph, and may be used by ships and boats (as flags are by day), also by lighthouses, the army, police, &c. The Lamp is simple, portable, and inexpensive; it consists of four lights—a natural light, white; and three slides, red, green, and blue. The white light denotes units; red, tens; green, hundreds; blue, thousands. Each number can represent a word or sentence, therefore, 9999 different words or sentences can be shown with the four lights, by showing the various slides the number of times each may be required. To show the No. 1234, show the blue light once, green light twice, red light three times, white light four times. A pause of four or five seconds to be made after completing a number. Gravitating Dial for taking altitudes and distances.

227. Brown, Walter, 53 Queen-street, Melbourne.—Self-heating Tailors' Iron. *Inv.* Sewing Machine. *Ma.*

228. Brown, William, 71a Smith-street, Fitzroy.—Model of Road Scraper, by horse-power. Model of Quartz-grinding and Amalgamating Machine. *Pat.* Model of Battery of Stampers, with Wood Guides and Lifts, lubricated by water instead of grease. *Des. and Ma.*

229. Buncle, John, 243 Elizabeth-street, Melbourne.—One or Two Horse-power Machine. Three-knife Chaff-cutting Machine. Improved Maize and Corn-crusher. *Des. and Ma.*

230. Burmeister, Leopold, 27 Little Bourke-street east, Melbourne.—Horizontal Steeple Clock (for one or four dials). Vertical Turret Clock. *Ma.*

231. Burton, Thomas, Graham-street, Fitzroy.—2 Cast-steel Shoeing Hammers. *Ma.*

232. Cairns, Alexander.—Portion of a Railway, marked A, with wheels and axles, adapted to the use of mines, or other light work, where manual or youth labor can only be employed. The rails are of the bridge form, and made of the lightest description yet used. Made at the Carron Iron Rolling Mills, Melbourne.

Portion of a Tramway, marked B, showing how Malleable Iron Rails can be adapted to bullock and horse drays. For use on roads where traffic is extensive, lessening expense of original construction as well as maintenance. Is applicable as an auxiliary to a metalled road, such as Sandridge to Melbourne, or wholly as a means of transit in the interior. Made at Carron Iron Mills.

233. Cairns, Wilson, and Amos, Carron Iron Yards, Melbourne.—Colonial Bar Iron and Antimony. *Ma. and Ex.*

234. Castlemaine Committee.—Models of Machinery. *Ex.*

235. Carpenter, W., Market-square, Geelong.—Four-wheeled Sliding Cab Phaeton. Four-wheeled Albert Drag. *Ma.*

236. Chitty, Robert, 5 Jolimont-square, Richmond-road.—Model of Schooner. *Des.*

237. Clay, J. H.—Model of a Frigate. *Ma.*

238. Clifford G. P., Melbourne.—Working Model of C. Clifford's Patent Boat-lowering Apparatus. *Ex.*

239. Coates, John, South Yarra.—Microscopic Preparations. *Ex.*

240. Commissioners of Victorian Exhibition.—A Twelve Stamper Battery for Crushing Quartz, half full size, with Ripple Tables, Amalgamating Apparatus and Appliances complete. The above is an exact copy of the Machinery used at the Port Phillip Gold Mining Company's Works, Clunes. This Model Battery is adeqnate to crush 70 tons of Quartz per week.

240*a*. Cooper, H. T., 95 William-street, Melbourne.—Model of Yacht. *Des.*

241. Dods, B. H. and Co., 42 Bourke-street west, Melbourne. —Hydraulic Apparatus and Machinery. *Ma.*

242. DEVEREUX, JOHN, 18 Marion-street, Fitzroy.—Musical Instruments, of Colonial Wood—1 ¾ Double-bass, copy of Palo Maggini, with Improved Tension-bar. One Bass-viol, copy of Gaspar de Cavero, with ditto. One Violin, copy of Joseph Grarnarious. One Violin, with improved Pegs. One Violin, copy of Joseph Grarnarious (English wood). *Ma.*

243. DANKS AND Co., Melbourne.—Brass and Wrought Iron Gas Fittings. *Ma.*

244. DAVIDSON, D., Breakwater, Williamstown.—Hulk *General Palmer.* Model of Clipper Ship *Prince of Wales. Ma. by Ex.*

245. DICKASON, T., Richmond.—Spoke Cutting Tool, blackwood. *Ma.*

246. ELDER, HENRY, 63 Bourke-street east, Melbourne.—2 Large Railway Clocks, 3 feet dials, dead-beat escapement, compensated pendulnm, balance hands, &c., &c., Huon Pine case. *Col. Ma.* 2 ditto ditto ditto, 3 ft. 6 in., ditto, ditto. *Ma.* 1 Sympathetic Electro-Magnetic Clock, showing dead seconds, minutes, and quarter-honrs, with only 3 clicks and rotchets in its construction; no pinions are used. Pat. by H. E. for its simplicity, and intended for Registering Uniform Time on Railways, Public Offices, &c. *Inv. Pat. and Ma.*

247. EXPLORATION COMMITTEE.—Map of Victoria, showing Route of Exploration Party. *Des.*

248. EVANS, THOMAS, Melbourne.—Model of Iron Rolling Mills erected in Melbourne. *Ex.*

249. FERGUSON, CHARLES, Williamstown —Model of a Life-Boat, constructed by Mr. Douglas Elder and the mechanics of the marine yard, Williamstown, who are engaged in building the five Life-Boats to be stationed on the coast of Victoria. This model is in exact conformity with the drawings furnished to the Government by the Royal National Life-Boat Institution, and is known as Peake's Life-Boat. The model is diagonal, of two thicknesses of clear pine, upon a scale of one inch to the foot. *Ex.*

250. FITZGERALD, THOS. N., 18 Lonsdale-street east.—A Splint for the Treatment of Obliquc and Compound Fractures of the Leg. *Des.*

251. FISHER, RICARDS, AND Co., MESSRS., 114 Collins-street.—Model of an Improved Mowing and Reaping Machine. *Ex.*

252. FLETCHER, P. P., Kew.—3 Improved Milk Pails, made by Hughes and Harvey. *Ex.*

253. GAUNT, THOMAS, Melbourne.—Patent Coffee Roasting Machine. *Ex.*

254. GANNS, THOMAS, Little Bourke-street east.—Self-acting Double Cylinder Coffee Roaster, heated by gas. *Des. and Ma.*

255. GIBBONS, SYDNEY W., 5 Collins-street east.—Rotating Stage adapted to Ross's Large Microscope. *Inv. and Des.*

256. GRAY, WILLIAM, Phillipstown.—Bricks, Drain-Pipes, Roofing and Flooring Tiles. *Ma.*

257. GROVES, THOMAS, 5 Granite-terrace, Fitzroy.—Minute Working Model of Steam Engine, in gold; weight, 1 dwt. 19 grs. *Des. and Ma.*

258. Grimoldi, J., 125 Little Lonsdale-street west, Melbourne.—Barometers and Thermometers, various. *Ma.*

259. Guyatt, George, 77 Collins-street east, Melbourne.—Surgical Instruments and Appliances. *Ma.*

260. Hackett and Co., Messrs., Brunswick-street, Fitzroy.—Albert car, with patent head, circular head and front. *Inv.* and *Ma.* Phaeton hung on a French Carriage, Elliptic Springs. *Ma.*

261. Harper, Robert, Union-street, Richmond.—Drawings of the Automatic Coffee Roaster. Pat. for Great Britain and Ireland, 31st July, 1861, by Robert Harper of Melbourne, Victoria. Working Model in course of preparation by Patentee.

262. Harrison, Edward, Back Creek.—Knife Cleaner. *Inv.*

263. Heath and Jackson, Messrs., Market-square, Geelong.—Model of Yacht *Southern Cross*. *Ex.*

264. Henderson and Bett, South Yarra.—Swing Plough. *Ma. by Ex.*

265. Hayward and Corker, Messrs.—Model of a Yacht. *Ex.*

266. Hiddle, James, 3 Victoria-terrace, Cardigan-street, Melbourne.—Model of Improved Shackles, adapted more particularly to chains upon which there is a heavy strain. *Inv. and Ma.*

267. Hill, G. B.—The Gradiometer; an instrument for taking the dip or inclination of strata, &c. *Inv.*

268. Inglis, ——.—Model of a Full Rigged Ship. *Ex.*

269. Jones, J., 41 William-street, Melbourne.—Engine for Extinguishing Bush Fires. *Inv. and Ma.*

270. Kay, Joshua A., 162 Bourke-street east, Melbourne.—Lock-stitch Sewing Machine; Chain-stitch ditto. *Inv and Ma.*

271. Knight, G. W., Sunbury.—Patent-ridged Bottom Railway Ballast Waggon, with side and centre delivery, used by Messrs. Cornish and Bruce, on the Railway Works. *Ex.*

272. Lambert and Curtis, Patterson-street, East Collingwood.—Iron and Copper Perforated Gratings for Stamper-boxes. *Inv. and Ma.*

273. Lamble, S., Great Ryrie-street, Geelong.—Case of Dead Horses' Feet, Shod. *Ma.*

274. Langlands Brothers, Melbourne.—Steam Engine (Vertical); Stamper Box; Iron Boat. *Ma.*

275. Leicester, C., 134 Flinders-lane east, Melbourne.—Anti-putrescent and Clarifying Filter; Disengaging Hook to prevent accidents by over-winding; 3 Washing Machines *Ma. and Pat.*

276. Leicester and Dickson, 134 Flinders-lane east, Melbourne.—Vacuo-Amalgamating and Indurating Machine. *Inv. and Pat.*

277. Love, R. A., Sandhurst.—Model of Suspension Bridge on an entirely new principle. *Inv. and Des.*

278. Lovell, Wm., Right-of-way off Collins-street west.—Improved Candle Mould. *Des. and Ma.*

279. McKay, J., 86 Collins-street west.—Portable Fire Engine. *Ma.*

280. McIntosh, D. M., Footscray.—Windmill, horizontal action; Railway Ballast Waggon; and new mode of Laying Rails. *Pat. and Ma.*

281. Maclean, A., 25 Bourke-street west.—Five-inch Brass Force-pumps; Four-inch Double Action ditto; Three-and-a-half-inch Brass ditto; Ornamental Iron Pump for gardens or farm yard; Lift-pump for household uses. *Ma.*

282. McNaught, Wm., Adelaide Hill, Chewton. — Model of Horse Puddling Machine for separating gold from alluvial soil (scale two inches to the foot); two Models of Williams's expired patent for Preventing Smoke in Furnaces. *Ma.*

283. Manuel, R., John-street, Moor-street, Fitzroy. — Patent Amalgamator; Model of Bridge designed to cross the Yarra. *Inv. and Pat.*

284. Martelli, A., C.E., Melbourne.—Eliptograph, a Mathematical Instrument for describing, with perfect continuity of curve, Elipses of any proportionate diameter; an Æolo-Hydraulic Machine. *Ma.*

285 Mathieson, James, 134 Queen-street, Melbourne.—Masons and Quarrymen's Tools. *Ma.*

286. Matthias, J. R., Punch's lane, Little Bourke-street east.—Bass Drum, of colonial blackwood, and composed of one piece of calf-skin. constructed on a new principle, rendering the instrument less liable to be affected by atmospheric changes than the bass drums now in use. *Inv. and Ma.*

287. Meredith, Joseph, Castlemaine.—Sludge and Quartz-Gold Amalgamator. *Inv. Ma. and Pat.*

288. Miller, F. McD., 131 Westgarth-street, Fitzroy.—Patent Air Gun and Breech-loading Rifle; Bullet Moulds, &c. *Inv. and Ma.* Cartridges, various descriptions, and Compressed Bullets. *Ma.*

289. Murray and Co., 107 Bourke-street east.—Pocket Chronometer Movement; Watch, showing name and date of month; Watch Movement, fitted with patent winding apparatus, to wind and set hands from pendant; Enlarged Model of same, with screw; Models of different Watch Escapements; Telltale or Detective Clock, applicable to prisons and public works; Microscope, fitted with discs to exhibit eight objects; New kind of Compressorium for Microscope; Microscopic Objects. *Ma. and partly Inv.*

290. Newman, S. C., 151 Wellington-street, Collingwood.—Screwing Tackle, and Engineer's Tools. *Ma.*

291. Nicholls, F., 187 King-street, Melbourne.—Working Model of Water Engine. *Inv. and Pat.*

292. Nicholas, H. C., Inkermann-street, St. Kilda.—Six-stop Harmonium, in blackwood and Huon pine case; Three-stop ditto, in cedar case. *Ma.*

293. Nicoll, David, 135 LaTrobe-street, Melbourne.—Improved Saw Set. *Des. and Ma.*

294. Payne, J. H., 31 Madeline-street, Melbourne.—Models of Patent Puddling Machine, Patent Whim, Benches of Retorts, and Smoke-consuming Furnace, and Boiler. *Ma.*

295. Perry, Jno., 149 and 167 Russell-street, Melbourne.—Bent rim for fellocs, blue gum felloes, ironbark spokes, blue gum spokes, blackwood rim, red gum felloes, of colonial wood. *Ma.*

296. Perry, C. J. C., Stevedore-street, Williamstown.—Patent Anti-Collision Dial and Shipwreck Preventor. *Inv and Pat.*

297. Powell, Walter, and Co., 7 Swanston-street, Melbourne.—Thermometer Oven, with Mantlepiece.

298. Purchas, A., Melbourne.—Working Model of Gas Tender for supplying Gas for lighting Railway Carriages. An invention for the purpose of providing gas for railway carriages when in motion or at rest. The Model represents a Tender which would contain sufficient gas to supply twenty-two lights for six hours. Each of these lights would equal, in illuminating power, two of the present railway carriage lamps, and would effect a saving of 30 per cent. in the cost of each light, besides 40 per cent. on the cost of the lamps, and about 70 per cent. on the cost of cleaning and repairing railway carriage lamps. *Inv. and Pat.*

299. Purchas, A., Melbourne.—Working Model of Platform of first-class Railway Carriage, showing application of self-acting Railway Brake. The action of this brake is as follows :—When it is necessary to stop a train, or reduce the speed, the engine-driver applies the brake on the engine with greater or less force as required, which causes the carriages to press on to the engine, and thereby thrust in the buffer-rods, and the upper end of the levers of the brakes being connected with the buffer-rods, the brake is applied instantaneously to each wheel in the train, where fitted. When the train is at rest, or at a low speed, the brake is put out of gear by the lever suspended underneath the connecting rod. It is estimated that by the action of this brake, railway trains may be stopped in one-fourth of the time required by the brakes now in use; therefore, the liability of collision will be reduced to a minimum. *Inv. and Pat.*

300. Putwain.—Submarine Diving Apparatus. *Ex.*

301. Randle, W.—Working Model of Locomotive Engine and Tender. *Ma.*

302. Rillstone, John, Station-place, Sandridge.—Working Model of Steam Cylinder Stamper. *Inv. and Pat.*

303. Ritchie, W., 27 Franklin-street west, Melbourne.—Model of Merchantman. *Des. and Ma.*

304. Roberts, John, Dunolly.—A Model of Windlass for deep sinking. *Inv. and Ma.*

305. Robison, W., 113 Flinders-street.—1 Brass Spirit Heater, Self-acting Cellar Pump, Brass Pump, and Hydraulic Blast. *Inv. and Ma.*

306. Robinson, J. C. (Porter, Victorian Railways).—Models of Ships; an Oil Painting. *Des.*

307. Russell, W. M., Brunswick-street, Collingwood.—Model of Record Buoy, designed to indicate the precise time and exact locality of ships foundering at sea. *Inv.*

308. Schreiber, Henry, 203a Bourke-street east, Melbourne.—Astronomical Instrument. Meteorograph. *Ma.*

309. Skinner, J. D.—Life Boat. *Ex.*

310. Skinner, Mr.—Model of the Iron Steam Ship *Phantom*, built at Messrs. Langlands, Melbourne. *Ex.*

311. Smith, Joseph, 27 Little Collins-street east.—Separator for Clearing Grain; Rolls of wire grating for Stamper Boxes, for Quartz Crushing. *Ma.*

312. Smith, J. W.—Model of a Yacht. *Ma.*

313. Stevens, G., Chapel-street, Prahran.—Set of Piano Forte Keys; Colonial Wood. *Ma.*

314. Stevenson and Elliott.—Stanhope Phaeton. *Ma.*

315. Stephen, John, 107 Little Bourke-street west.—Model of a Powerful Pump; Model of Hydraulic Ram; Patent Bottling Machine, for Wines and Ales. *Inv. and Ma.*

316. Steiling, George, 183 Bridge-road, Richmond.—Flower Pots, Fire Bricks, Milk Pan, and Jam Pots. *Ma.*

317. Stokes, Thos., 100 Collins-street.—Embossing Press. *Des. and Ma.*

318. Strachan, John.—Model of a Bush Fire Engine. *Inv. and Ma.*

319. Thomas, Wm., South Yarra.—Model of a Yacht, made by *Des.* for a Club. *Ma.*

320. Thompson, J. J., 18 Alma-street, Melbourne.—A Colonial-made Electro-Magnet. Length of bar 3 feet, diameter 2 inches, quantity of wire 1000 feet. *Ma.*

321. Thomson, ——.—Model of a Yacht for the Hobson's Bay Yacht Club. *Des.*

322. Thomson, R. and W., 108 Little Bourke-street west, Melbourne.—Mercurial Filter for Separating Gold Amalgam from the Liquid Mercury. *Inv. and Pat*

323. Thorne, James, 3 Lansdowne-street, Fitzroy-square.—Silver Strings for Violins, Tenors, Violoncellos, &c., on an improved principle, capable of retaining their brilliancy of tone unimpared in any climate. *Inv. and Ma.*

324. Trembling, George, Hope-street, Geelong.—Model of Greenhouse. *Des. and Ma.*

325. Warhurst and Son, 212 Elizabeth-street, Melbourne.—2 Chaff-cutting Machines; 1 Winnowing Machine; 3 Churns; 1 Fan; and 2 sets of Flower-stands. *Ma.*

326. Warwick, Henry, 37 Barkly-street, Carlton.—Cork and Instrumental Boots for Deformities. *Ma.*

327. WENZEL AND ENES, 129 Bourke-street.—Metallic Pocket Barometer. *Ma.*

328. WHITE, G. AND P., Albert-street, Melbourne.—An Improved Fire Hose Director, with Revolving Nozzles, embracing three different sizes, any one of which can be used in an instant by turning the revolving plate, the advantage of which will be seen in the event of the fire breaking out in a remote or inaccessible part of the building. The fireman by immediately turning on the second or smallest nozzle, as the case may require, can at once play upon the point of danger, from the additional force given to the water by the reduction of the orifice. *Ma.*

329. WHITE, G. AND P., Albert-street, Melbourne.—An Improved Lever Hose nnion, the advantages of which are that it can be connected or disconnected in an instant while the water is running full bore. Brass Taps, &c., and Gas Fittings. *Ma.*

330. WHITE, W. AND G., Williamstown.—Models of Boats and Ships. *Des. and Ma.*

331. WILKIE, DAVID E., 106 Collins-street east.—Submarine Propeller on a new principle, composed of a shaft and two feathering blades with semi-rotating rod. *Inv.*

332. WILKIE, JOSEPH, 15 Collins-street.—A Colonial-made Piano. *Ma.*

333. WILLIAMS, W.—Carriages, &c.; Machine Wrought Timber. *Ma.*

334. WILSON, DONALD, Franklin-street, Melbourne.—A Double Seated Buggy. *Ma.*

335. WILSON, TWENTYMAN, Little Bourke-street east.—Cast Steel Shoeing Hammers. *Ma.*

336. WITTON, H., Professor of Music, Collingwood.—Case of Clarionet Reeds. *Ma.*

337. WOODS, J., M.P., Model of a Stone-breaking Machine. *Ex.*

338. WORDSWORTH, AMBROSE, 211 Swanston-street, Melbourne. —Hydraulic Ram for raising water by its own momentum. *Ma.*

CLASS VI.

ANIMAL PRODUCTS, AND THE MANUFACTURES AND PROCESSES CONNECTED THEREWITH.

COMMITTEE:

THE HON. SIR FRANCIS MURPHY, V.P.
CHARLES E. BRIGHT, Esq.
THE HON. JOHN O'SHANASSY, Esq., M.P.

339. Acclimatization Society, Melbourne.—Wool of Angoras, Llamas, Alpacas, Chinese Sheep, and Dromedaries. *Ex.*

340. Askunas and Co., 58 William-street, Melbourne.—Flat Island Guano.

341. Bignell and Edolls, 163 Great Bourke-street east.—Trotters' Oil; Neats' Foot Oil. *Ma.* Shank Bones, Horns, and Hoofs. *Ex.*

342. Boehm, John, Yarra Bank Soap Works, East Collingwood. —1 case Colonial-made Soap; 1 case Colonial-made Candles. *Ma.*

343. Brearley Brothers, Malop-street, Geelong. — Curried Hides, Butts, &c. *Pro.*

344. Brown and Co., Winter's Flat, Castlemaine.—Box of Tallow Candles; bars of Yellow, White, and Mottled Soap. *Ma.*

345. Bullock, R. H., Geelong.—Lady Julia Percy Island Cave Guano. *Ex.*

346. Clark, John, 137 Elizabeth-street.—Leather and Tanned Hides—crop, sides, and butts. Curried Leather—black harness, brown harness; rein hides, black and brown; bridle bits, stirrup bits, skirt hides, bag hides, kip hides, calf skin, grained ditto, black grain hides, brown and waxed kangaroo skins; black, brown, and shaved basils and hogskins; belt hides, coach hides, and glue pieces, swans' down, furs, skins, calf skins, kangaroo skins, seal, and sundry other native skins.

347. Corrigan, S. B., Aberdeen-street, Geelong.—3 bales of Scoured Wool—Combing, Clothing and Lambs—25 lbs. each. *Ex.*

348. Crossley, William.—An Oscillating Steam Engine. *Ma.*

349. Crowther and Pokorny, 31 Bourke-street west.—Phosphatic Guano, from varions Australian Islands. *Ex.*

350. Currie, J. L., Esq., Laree Cressy.—Fleeces Pure Bred Washed Wool (Lot 4); Do. Greasy Do (Lots 3 and 5). *Ex.*

351. Dalgety and Co., Messrs., Kal Kal.—Sample Bale of Wool. *Ex.*

352. De Castella and Anderson, 127 Flinders-lane east.—Wool of Chinese Sheep. *Ex.*

353. Degraves and Co., Melbourne.—Sample Bale of Wool. *Ex.*

354. Douglass, A. and Co., Geelong.—Scoured, Combing, Clothing, and Lambs' Wool. *Ex.*

355. Downie and Murphy, Melbourne.—Purified Tallow. *Ma.*

356. Elder and Son, Kuruc Kuruc, Rokewood.—2 packets, 75 lb. each, Merino Fleece Wool. *Ex.*

357. Eve, J. S., 171 Bourke-street.—Hair Work: Gents' Wigs; Ladies' Ditto. *Ma.*

358. Fitts, C., Sandridge.—Colonial made Glue. *Ma.*

359. Gibbons, W. Sydney, 5 Collins-street east.—Guanos and Artificial Manures, with their analyses. *Ex.*

360. Goldsbrough, R., and Co., Melbourne.—Sample bale of Pure Bred Washed Fleece Wool. *Ex.*

361. Hart, H. H., 105 Collins-street west.—Tanned Opossum Rug. *Ma.* Aboriginal War Implements. *Ex.*

362. Hayes and Co., Saltwater River.—Neats' Foot Oil and Railway Grease. *Ma.*

363. Johnson, J. G., Back Creek.—Three Bottles Atmospheric Oil. *Ma.*

364. Kitchen and Sons, Sandridge.—Tallow. *Ma.*

365. Learmonth, T. and S., Ercildoun, Burrumbeet.—Pure Bred Washed Fleece Wool (Lot 1). Do. do. Ram's Fleece (Lot. 10). Do. Greasy Fleece Wool (Lot. 7). *Ex.*

366. McKellar, T. Esq., Kannawalla, Hamilton.—Pure Bred Washed Fleece Wool (Lot 2). *Ex.*

367. Macmeikan and Co., Flemington Bone Mills.—Hoofs for manufacture of Prussian Blue, &c.; Bones for Knife Handles, Buttons, &c.; Mixed Tallow; Neats' Foot Oils; Glue Pieces in lime and salted; Superphosphate of Lime; Bone Dust; Half-inch Bones. *Ma.*

368. Marshall, Thos., Mercer-street, Geelong.—Scoured Wool and Leather.

369. Mud Island Guano Company, Melbourne.—Guano. *Ex.*

370. Ridge, Mrs.—Angora Goat Hair. *Ex.*

371. Row, E., Esq., Melbourne.—Sample Bale of Half-bred Wool, being first cross between Merino and Cotswold. *Ex.*

372. Russell, P., Esq., Carngham.—Sample Bale Cross Bred Wool. *Ex.*

373. Russell, Thomas, Wanook, Rokewood.—2 Packages, each 25 lb., Fleece Wool.

374. Skeene, W., Esq., near Hamilton.—Pure Bred Washed Fleece Wool (Lot. 9). *Ex.*

375. Smith, William, South Yarra.—2 Pairs Sides Crop Leather; 2 Crop Butts; 1 Writing Desk. *Ex.*

376. Williamson, John, 73 Napier-street, Collingwood.—Curled Hair. *Ma.*

377. Wilson, Brothers, Ashens, Glenorchy.—Pure Bred Greasy Fleece Wool (Lot. 6.) *Ex.*

378. Wilson, E., Esq., Melbourne.—Hair from the Poictou Ass. *Ex.*

379. Woodward, George, Kew.—Victorian Guano, and Deodorized Night Soil. *Pat. and Ma.*

CLASS VII.

Section I.—ARTISTIC AND ORNAMENTAL PRODUCTS.

Section II.—INDUSTRIAL PRODUCTS.

MISCELLANEOUS.

COMMITTEE:

HIS HONOR SIR REDMOND BARRY, President.
CHARLES GAVAN DUFFY, Esq., M.P.
CHARLES HOTSON EBDEN, Esq., M.P.
CHARLES EDWARD BRIGHT, Esq.
PROFESSOR McCOY.
ALFRED RICHARD CECIL SELWYN, Esq.

380. Alcock and Co., Messrs., 132 Russell-street.—Myrtle Wood and Blackwood Billiard Tables. *Ma.*

381. Allan, Thos.—Specimen of Wool Work: Uncle Tom and Eva. *Des.*

382. Alves, J., 81½ Elizabeth-street.—Fishing Tackle, Colonial Wood. *Ma.*

383. Alcock and Co., Messrs., 132 Russell-street.—Specimens of Turnery in Wood and Ivory. *Des.*

384. An Emblematical Flag made for the North-western Gathering by *Ex.*

385. Angus and Elleray, Barker-street, Castlemaine.—Specimens of Letter Press Printing. *Ex.*

386. Arnold, Bradford, and Co., Messrs., Franklin-street west.—Yeast Powder, Vinegar, Champagne Cider, Paste and Liquid Blacking, and Washing Powder. *Inv and Ma.*

387. Aresti, Joseph, 63 Kerr-street, Fitzroy.—An Example of the New Process of Preparing Painted or Washed Drawings on Stone; also, Examples of Granulations of a Novel Character, developed since it was exhibited at Paris. *Ex. by the Inv.* Masonic Painting. *Des.*

388. Arnoldi, X., 87 Russell-street, Melbourne.—Seal Impressions. *Des.*

389. Ashmore and Sons, Wm., Moorabool-street, Geelong.—Pedestal Sideboard and Lightwood Carved Pole Screen; Easy Chair and Needlework. *Des and Ma.*

390. Bachelder and O'Neil, Collins-street.—Photographs: Sir H. Barkly and Staff. Captains Bancroft and Timins, Colonel Pitt and Volunteer Staff, Captains Hall and Pitt. Pentridge Volunteer Rifles, Capt. Champ; Brighton Do., Capt. Mair; Richmond Do, Capt. Martin; West Melbourne Do, Capt. Guthrie; South Yarra Do., Capt. Moodie; North Melbourne Do., Capt. Irving; Carlton Do., Capt, Radcliff; Collingwood Do, Capt. Sprent; Williamstown Do., Capt. Stewart; Collingwood Volunteer Artillery, Capt. Raven; Richmond Do, Capt. Stokes; Prahran and South Yarra Do., Capt. East; St Kilda Do, Capt. Ross; Geelong Volunteer Mounted Rifles, Capt. Bell; Light Dragoons, Capt Hervey; Sandridge Volunteer Naval Brigade, Capt. Van Zuilecom. *Ex.*

391. BALLINGER, J., 48 Little Bourke-street east.—One foot of ¾-inch Lead Pipe, part of first pipe made by the hydraulic power of the Yan Yean. *Ex.*

392. BARRY, M. J., Architect, Melbourne.—View of the Hon. J. O'Shanassy's Residence. *Ex.*

393. BATEMAN, CLARK, AND CO., Back Creek.—Copy of *North Western Chronicle*, printed in gold on white silk. *Ex.*

394. BATTEN, —.—Map of Animal and Vegetable Creation. *Ex.*

395. BEAL, W. T., Prahran.—Soaps, variety; Soda Crystals. *Ma.*

396. BEANEY, JAMES G., F.R.C.S., Surgeon to the Melbourne Hospital.—An Improved Fracture Apparatus. *Ex.*

397. BEARD, JAMES, Mexican Cottage, Hoddle-street.—3 Inlaid Marble Paper Weights, and 1 Inlaid Penholder. *Ex by Des., Inv., and Ma.*

398. BEARD, ——.—Painting in Water Colors: "New Zealand Native." *Ex.*

399. BELL, WM., Kennedy's Creek, Bulleen.—Specimen of Bank Note executed in the Colony. *Des.* and *Inv* of part of the printing machinery used. *Ex*

400. BENJAMIN B., 62 Great Bourke-street east.—Colonial-made Stays and Corsets. *Des.*

401. BEECHWORTH LOCAL COMMITTEE.—Soap. *Ex.*

402. BICKERTON, R. F., 65 Collins-street east, Melbourne.—Glass Case containing Hats and Caps, colonial made; and Glass Case containing Material used in Manufacture of Hats. *Des.*

403. BISHOP, ALEX., 153 Bourke-street east.—Letters in Gold and Colors on Glass. *Ex*

404. BLAKE AND CAMERON, 3 Bourke-street west.—One Single Buggy Harness. *Ma and Des.*

405. BOUCHET, JOURDAN, AND CO., 96 Great Bourke-street east.—Wigs and Perfumery. *Ma*

406. BOWIE, DR., Yarra Bend Asylum—Mosaic Table, made of colonial woods; Photographic Views of Asylum and Patients. *Ex.*

407. BRANCH, JAMES, Castlemaine.—A Model in Stone. *Ma.*

408. BRIGHT AND HITCHCOCK, Geelong.—Mantles and Millinery. *Ma.*

409. BRITTON AND OTHERS, Hargreaves-street, Castlemaine.—A Copy of the *Castlemaine Advertiser*, tri-weekly Paper. *Proprietors.*

410. BROWNE AND REID, 10 Collins-street east.—Coffees, roasted and ground, and Spices, ground. *Ma.*

411. BROWN, WALTER, 53 Queen-street.—Specimens of Flour Bags. *Ma.*

412. BRUCE, J. A. V., Melbourne.—Gold Presentation Inkstand, with Pedestal. *Ex.*

413. Buckley, Captain.—Map of Melbourne. *Ex.*

414. Burkitt, A. H., Beechworth.—Oil Sketch of Reid's Creek and Woolshed Diggings. *Des.*

415. Burgoyne, Mrs., Richmond.—Eight Shades Wax Flowers, Seaweeds. *Ex.*

416. Cairnes, E. M., Commissioner of Mines Office.—Artistic Penmanship. *Des.*

417. Cadogan, Miss, Carlsruhe.—Knitted Silk Shawl. *Ex.*

418. Campbell, Mathew.—Oil Painting: *Lady Bird* steamer. *Ex.*

419. Campi, T. and A., 122 Russell-street.—Large Glass, Silvered in the Colony, and Frame made of Colonial Fancy Woods. *Ma.*

420. Camroux, Sydney Geo., Melbourne.—Monument to General Havelock; Mother's Pet, Marble Bust (S.); Jealousy, a Bust; Medallion of late Professor Hoffgarten, of Berlin. *Des.*

421. Carr and Surridge, Flinders-lane.—Coffee, Roasted and Ground; Cocoa Nibs, Cloves, and Mixed Spices. *Ma.*

422. Carr and Son, 128 Spring-street.—Window Blinds. *Ma.*

423. Castlemaine Committee. — Printing, Bookbinding, Medals, Drawings, and 31 Photographic Views of Castlemaine and the Suburbs.

424. Champ, W., Pentridge. — Work Table, Fire-screen and Flower-stand of Australian Woods, executed by prison labor; Model of Chinese Junk, by Chinese prisoner; Prepared bluestone and granite Fountain by prisoner; Prisoner's jacket, waistcoat, and trowsers; Men's and women's boots and shoes; Warden's tunic, vest, trowsers, and cap, made by persons who learned their trades in the penal establishment.

425. Chatfield, Charles Mayor, 126 Queen-street, Melbourne.—Austral Earth Soap. *Inv.*

426. Chirnside, T., Werribee.—Stock Whip; 2 Hide Saddle Girths; 2 Hide Whips; 3 Hide Ropes. *Ex.*

427. Christian, Henry, Kew.—Halters made of Colonial Rope, from imported Manilla *Ma.*

428. Chuck, Thomas, Octavia-street, St. Kilda.—3 ft. 6½ in. Iron Continental Mattress and Upper Horse Hair Mattress. *Inv. and Ma*

429. Ciderberg, Mrs., Sandridge. — Royal Victoria Pattern Wool Work. *Ma.*

430. Clark, D. G.—Dressing Case made of Colonial Woods 15 years ago. *Ex.*

431. Clark and Bedford, 9 Collins-street west.—A Sans Pli Shirt, made without gathers. *Ma.*

432. Clarson, Shallard, and Co., 85 Bourke-street east.—Specimen of Fancy Printing, Ornamental ditto; Bookwork, and Labels.

433. Clubb, T. J. and E., 138 Collins-street east.—Trusses, Stockings, Knee Caps, Ankle Socks, and Gents' Belts. *Inv. and Ma.*

434. Commissioner of Mines.—50 Plans and Sections relating to Mining Operations; Four cases containing Minerals.

435. Coates, Dr., South Yarra.—Microscopic Objects. *Ex.*

436. Commissioners of the Victorian Exhibition.—Case of Gothic design, for Exhibiting a collection of Alluvial Gold, Quartz, Specimens, and Precious Stones; designed by Mr. Daniel Livingstone, executed by Messrs. Thwaites and Son, Little Collins-street, Melbourne.

437. Commissioners of the Victorian Exhibition.—Specimens of Fish indigenous to the waters of the Colony.

438. Commissioners of the Victorian Exhibition.—Book containing the Statistics, &c., &c., of the undermentioned Corporations and Municipalities of the Colony of Victoria, viz.: Corporations of Melbourne and Geelong; Municipalities of Amherst, Ararat, Avoca, Ballaarat, Ballaarat (East), Barwon (South), Beechworth, Belfast, Brighton, Brunswick, Buninyong, Carisbrook, Castlemaine, Clunes, Collingwood, Creswick, Daylesford, Dunolly, Emerald Hill, Footscray, Hamilton, Hawthorn, Heathcote, Hotham, Kilmore, Kyneton, Maldon, Maryborough, Newton and Chilwell, Portland, Prahran, Richmond, Sandhurst, Sandridge, Smythesdale, St. Kilda, Taradale, Warrnambool, Williamstown.

439. Commissioners of the Victorian Exhibition.—Exploration Pack Saddle and a pair of Saddle-bags.

440. Cohen and Co., L. J., 21 Bourke-street east.—Youths' Wearing Apparel. *Ma.*

441. Cook and Fox, 58 Queen-street.—Account, Ledger, Journal, and Cash Books. *Ma.*

442. Cook, Charles, Barker-street, Castlemaine.—Cakes, Biscuits, and Sundry Confectionery; 50 sorts. *Ma.*

443. Cooling, Richard, 43 and 47 Bourke-street east.—Colonial-made Garments. *Ma.*

444. Corking, Richmond.—Blackwood Bookcase. *Ma.*

445. Cowderoy, B., 38 Collins-street east.—Photographic Views of Beechworth, and the Mining Claim of El Dorado; a Case of Stuffed Birds; several Bottles of Snakes, Fish, Reptiles, and a few Curiosities from Ovens District. *Pro.*

446. Cox and Luckin, Bourke-street.—A Collection of Photographs of Buildings in Melbourne and its Suburbs. *Ex.*

447. Cramer and Penzholz, 26 Little Bourke-street west.—Small case of Colonial-made jewellery. *Ma.*

448. Crofts, Oxley, and Crofts, 149 and 151 Bourke-street east.—Pure Tallow Candles, require no snuffing; Pale Yellow Soap. *Ma. for Ex.*

449. Crouch and Wilson, 49 Elizabeth-street.—1. View of Town Hall, Prahran; 2. View of Wesleyan Chapel, Brunswick-street, Fitzroy; Photographs of Buildings erected by Exhibitors. *Des.*

450. Daintree, R. Melbourne.—Photographs of Fossils, Rock Sections, and Scenery, illustrative of Victorian Geology. *Ex.*

451. Dakin, Thomas, 107 Little Lonsdale-street west.—Bee-hives, Colonial make. *Ma.*

452. Danks, John, and Co., 34 Bourke-street west.—Wrought Ironwork; Brass Cocks; Gas Fittings and Pumps. *Ma.*

453. Davies, ——, Bourke-street.—A Collection of Photographs of Buildings in Melbourne and its Suburbs, and Portraits. *Ex.*

454. De Castella and Anderson, 127 Flinders-lane.—Patent Bitumenized Pipe. *Pat. and Ma.*

455. Decourtet, E., 90 and 96 Russell-street.—Stays; Surgical Belts; and Millinery. *Ma.*

456. De Gruchy and Leigh, Messrs., 7 Flinders-lane west.—Specimens: Lithography, Chromo and Plain. *Des.*

457. Derham, ——.—Case and Book, and Natural Curiosity. *Ex.*

458. Detmold, W., Bookbinder, 35 Collins-street.—1 skin of Morocco, inlaid various colors, all leather; 3 vols. Shakespeare; 5 vols. Waverley Novels; 4 vols. London News; 3 vols. Cornhill Magazine; 1 vol. Soyer's Cookery; 1 vol. Boswell's Life of Johnson; 2 vols. Chambers's Encylopædia; 1 vol. Bailey on Bills; 1 vol. May's Parliamentary Practice; 2 vols. Arnauld on Marine Insurance; 1 vol. London Punch; 1 vol. Melbourne Punch; 2 Bibles; 1 vol. Music; 1 vol. Art Journal; 2 vols. Hood's Iron; 1 vol. Mrs. Heman's Poems; 1 vol. Webster's Dictionary; 1 vol. Stock and Share Journal; 1 vol. Kelly on the Vine in Australia; 1 vol. Cole's Gardening in Victoria; 1 vol. Laury's Interest Tables; 2 vols. Handbook to Australia; 1 vol. McCombie's History of Victoria; 1 vol. Moyarra on Australian Legends; 1 vol. Macaulay's History of England (vol. v.); 4 Albums adapted to Photographic Portraits; 1 vol. Humboldt's Letters; 1 vol. Nürmberg Cronickle (the property of the Public Library); 1 vol., size 3-8ths of an inch by 5-8ths; 1 large Album; 12 Account Books, various sizes and bindings; 2 Invoice Books; 2 Scrap Books.

459. Dicker, Chas., Dunolly.—A Series of 24 Photographic Views of the Principal Buildings in Dunolly.

460. Dike, N. W., 16 Stephen-street.—Specimens of Graining and other Decorative Works. *Pro.*

461. Dillon and Burrowes, 4 Great Bourke-street.—2 cases of Confectionery and Lozenges. *Ma.*

462. Donaldson and Co., 71 Bourke-street west.—Easy Chair. *Ma.*

463. Doubleday, John, 63 Napier-street, Fitzroy.—Pair of Bullock's Horns, and Specimen of French polished Marble. *Ex.* Colonial made Inkstands. *Ma.*

464. Downie and Murphy, Melbourne.—Soap and Candles. *Ma.*

465. Draper, T. J., 83 Great Bourke-street, Melbourne.—Inlaid Blackwood Coffee Table. *Ma.*

466. Eaton, Miss.—Native Flowers in Water Colors. *Ex.*

467. Edwards, W., 85 Collins-street.—Silver Plate. *Ma.*

468. Ellemor, F., Melbourne.—Graining in imitation of Woods and Marbles. *Des.*

469. Ellis, W. E., 104 La Trobe-street west.—Case of Lessons on Objects. *Ex. by Des. and Ma.*

470. Espie, G. and J., Bourke-street east.—Shirts. *Ma.*

471. Evans and Somerton.—The *Maryborough Advertiser*, Printed on Satin and Bound in Morocco. *Ex.*

472. Eve, J. S., Bourke-street.—Wigs, Hair, &c. *Ma.*

473. Ewing, Thomas A., 113 Brunswick-street, Fitzroy.—Yeast Powder. *Ma.*

474. Fatherly, Charlotte, Templeton-street, Castlemaine.—Original M.S. Music of 2 Anthems; 1 Part Song; 1 Ballad. *Comp.*

475. Felton, Alfred, 41a Swanston-street.—Williams's Australian Yeast Powder. *Pat. and Ma.*

476. Ferguson and Mitchell, 59 Collins-street west.—Specimens of Colonial Lithography and Engraving. *Des. and Ma.*

477. Ferguson and Urie, Curzon-street, North Melbourne.—4 specimens of Ornamental Glazing in Lead. *Ma.*

478. Ferres, J., Government Printing Office.—Specimens of Printing, Bookbinding, and Stereotyping. *Des.*

479. Fleming, Michael, 90 Swanston-street.—1 pair of Dress Wellington, and 1 pair strong Lace-up, Boots. *Ma.*

480. Flinn, Miss, Queensberry-street, Melbourne. — Crayon Drawing. *Des.*

481. Ferguson and Urie, Curzon-street, North Melbourne.—4 Specimens of Ornamental Glazing in Lead. *Ma.*

482. Ford Brothers, 421 King-street.—Patent Hats and Caps; Machine-made Legs of Wellington Boots; Military Saddle Cloths, Bags, and Ornamental Machine Sewing; Camels' Shoes. *Inv. Pat. and Ex.*

483. Ford, Thomas, 33 Bourke-street east.—Set of Photographs of Colonial Scenery, colored by G. A. Gilbert, Esq

484. Freemantle, Mrs., Chapel-street.—Fancy Needlework in Berlin Wools, worked by Exhibitor.

485. Fraser, ——, Back Creek.—Hair Oil and Hair Dye.

486. Fulker, —— , 50 Lygon-street, Carlton.—2 Cases Birds; 2 ditto of Fish; 5 Glass Shades of Birds. *Preserved and Ma. by G. F.*

487. Fulton, Anna Maria, 160 Bourke-street east.—Ladies' Corsets and Sustaining Belts. *Ma.*

488. Galvin, John, 73 Collins-street west.—Case of Light Hats. *Ma.*

489. Gant, H. D., Geelong.—Guard Rings, &c. Made of Native Hair. *Ma.*

490. Gasak, ——, Walpole-street, Kew.—Screen, with fragmentary illustrations (photographic). *Ex.*

491. Gaskell, Joseph, 195 Bourke-street east.—3 cases Stuffed Birds; Panther and Seal; Reptiles; Emeu and other Oils; 1 case Wax and Colors for making Wax Flowers and Fruit.

492. George, Francis N., York-street, Prahran.—Sample of Shives, Spiles, &c. *Ma.*

493. Gibbons, W. Sydney, 5 Collins-street east, Melbourne.—Products prepared from Coal Tar; Magnified Photographs of microscopic objects, prepared by exhibitor; Microscopic Preparations, various; preparations illustrative of the Composition and Adulteration of Food. *Ex.*

494. Girdler, C. M.—Mat made of Spices. *Ma.*

495. Giraud, L., 128 Brunswick-street.—Confectionery.

496. Glass, C. E., Market-square, Castlemaine.—Almanac for 1862 and 1863, in covers; 2 Views of Castlemaine in 1861. *Pro. Des. Printer, and Pub.*

497. Goodhugh and Co., William, Flinders-lane east.—Specimens of Book and General Printing. *Ma.*

498. Grant, W., Melbourne.—Design for Wire Suspension Bridge over the Yarra, Victoria-street. *Des.*

499. Gray and Waring, 46 Little Bourke-street east.—Cooperage, Colonial-made Dairy Utensils. *Ma*

500. Greenwood, S., Poplar Villa, Richmond.—Chessboard, Carved in Cardboard, under plate glass: every minute part of it (with the exception of frame and glass) carved by hand and with a common penknife. *Des. and Ex.*

501. Greenwood, Thomas, 246 Elizabeth-street, Melbourne.—1 pair Silver Mounted Bullock Horns. *Ex.*

502. Grenier and de Tourette, 13 Collins-street east.—2 pairs of Riding, 1 pair Wellington, 1 pair Elastic Side, Boots. *Ma.*

503. Grieve, James, 217½ King-street.—Map of Victoria, colored by Mrs. Jones.

504. Grosse, R., 72 Collins-street east—Specimens of Wood Engravings and Bismuthography.

505. Hackett, J., Brunswick-street, Fitzroy.—Leather Work.

506. Haigh, Edward, Murphy-street, South Yarra.—Photographic and Stereoscopic Views in England, France, and Victoria. *Des.*

507. Ham, W. — Water Color Sketch: "Sandridge Sugar Works." *Ex.*

508. Hamell and Co., 49 Queen-street.—Specimens of Lithography and Engraving on Vellum. *Ex.*

509. Hancke, Miss, Richmond.—Artificial Flowers. *Ma.*

510. Handasyde, McMillan, and Co., 60 Elizabeth-street.—Bee Hives, Bee Glasses, Feeders, and Honey Knives; Honey in the Comb, and prepared. *Ma.*

511. Hardess, G. M., Queen-street.—Photographs: Views of Royal Park. *Ex.*

512. Hayes and Co., P., Saltwater River.—Soap and Resin Oil. *Ma.*

513. Hart, H. H., Collins-street.—Oil Painting by Dexter: Wood Ducks. *Ex.*

514. Heath, Richard.—Specimen of Gold Artificial Teeth in Vulcanite. *Ma.*

515. Heath and Cordell.—Victorian Sheet Almanac. *Ma.*

516. Henry, James.—A Curiosity (Calf). *Ex.*

517. Henson, H. E., 64 Collins-street.—Breech-loading Gun, Bullet Moulds, Caps, Bird Skins, &c. *Ma. Ex.*

518. Henty, Mrs. R.—Pen and Ink Drawings: "The Light of the Harem," and "Let him that is without Sin cast the first Stone." *Ex. Des.*

519. Hill, T. A.—Oil Painting. *Ex.*

520. Hobbs, S. K., 29 Collins-street east.—Bride Cake. *Ma.*

521. Hodder, W. C., Emerald Hill.—Oil Painting. *Des.*

522. Hodges, J. T., Phillipstown.—Hair Ball found in a Bullock slaughtered by the Exhibitor. *Ex.*

523. Hollings and Chambers, 4 a'Beckett-street west. — Woollen Flock. *Ma.*

524. Hodgson, A. T., Castlemaine.—View of Castlemaine, 1857, by Rowe. *Des.*

525. Horn, W. H.—Mould Carvings. *Ma.*

526. Hore, Rufus.—Six Models of Ships. *Ma.*

527. Hooper, George, Back Creek.—Case of Native Birds. *Ex.*

528. Houten, T. H. Vanden, High-street, Prahran. — Oil Painting. *Des.*

529. Howard, Rev. C., and P. Le P. Bookey, Esq.—A Collection of Birds, Reptiles, &c., from Beechworth. *Ex.*

530. Huenerheim, H., Mrs., 161 Collins-street east. — A Flowered Dress. *Ma.*

531. Huxley and Parker, Melbourne.—Head and Tomb Stones. *Ma.*

532. Jenkinson, William, 90 Nicholson-street, Fitzroy.—Portable Oven. *Inv. and Ma.*

533. James, Edward J., Back Creek.—Photograph of Back Creek and Vicinity. *Ex.*

534. Johnston, Thomas, Royal Hotel, Chewton.—Amateur Sketch, Water-color; Seven Electro Medallions, in Copper, from Plaster Casts in Wax, by Smee's Process. *Ex.*

535. Killmister, James, 85 Victoria-street west.—Saddles. *Ma.*

536. King, Ellen, 117 Brunswick-street, Collingwood.—Straw Bonnets and Hats. *Ma.*

537. Kitchen and Sons, Sandridge.—Candles and Soap. *Ma.*

538. Knight, J. G., Architect, Melbourne.—New Government House. First Prize Design. *Ex.*

539. Knight, John, 56 Queensberry-street east.—Portable Spring Mattress. *Inv and Ma.*

540. Lade and Sanders.—Buggy Harness, with Chased German Silver Mounting; Ladies' Side Saddle. *Ma.*

541. Lange, Charles, 62 Collins-street east.—Artificial Teeth. *Ma.*

542. Lansdell, ——.—A Specimen of Colorless Glass, Silvered. *Ma.*

543. Lansdell, Stephen, and Mrs., Flinders-lane.—Ring Cases. *Ma.*

544. Lawson and Pearson, 3 Collins-street west.—Copperplate Engraving; Lithography. *Des.*

545. Leviny, Ernest, Castlemaine.—Silver Ornaments and Mounted Emeu Eggs; Gold Inkstand. *Ma.*

546. Levitt, S. J., High-street, St. Kilda.—Leatherwork Frame; Colonial-made Jewellery; Photograph. *Ma.*

547. Levy Brothers, 24 Great Bourke-street.—One Glass Case, containing Six Gold-mounted Myall Wood Pipes, *col. mat. and ma.*; one Photograph of Levy Brothers' Premises, in Myall Wood Frame. *Col. Ma.*

548. Ligar, C. W., Government Surveyor.—Lithographs and Photographs; Model of the Colony of Victoria, in Plaster. *Ex.*

549. Lindsay, Alexander, 26 Curzon-street, Hotham.—Beehive. *Ma.*

550. Lovell, Wm., 78 Collins-street west.—One Child's Cot, and one Cedar Bookcase. *Ma.*

551. Loyal Industry Lodge, Manchester Unity, I. O. O. F.—Banner, Painted by John Bell. *Ex.*

552. LUCAS, ——, Melbourne.—Specimens of Printing. *Ma.*

553. LYALL, JOHN L.—Drawing for Stained Glass. *Ma.*

554. LYON, J. L., Main-street, Maldon.—Stained Glass. *Des.*

555. MACKENZIE, J. F. AND CO., 35 Lygon-street, Melbourne.—Spices, Machine-ground and dressed; Samples of Coffee, roasted by a Machine invented in this Colony. *Ma.*

556. MCCAPE, ARTHUR, Conners-street, Chiltern.—Pat. Powder-proof Lock. *Inv. and Ma.*

557. MCCLELLAND, SAMUEL, 41 Little Bourke-street east.—Two Water Tanks. *Ma.*

558. MCCOY, PROFESSOR, University, Melbourne.—Plates of the Decades of the Memoires of the Museum of Victoria, illustrative of the present Zoology and Palæontology of Victoria; Six Cases of Australian Insects, from the National Mnseum. *Ex.*

559. MCCRAE, CAPT.—Ovens Topaz Brooch. *Ex.*

560. MCDONALD, ——, Bourke-street.—A case of Photographic Portraits. *Ex.*

561. MCFARLAND AND SONS, Melbourne.—Stock Whip, 17 feet long. *Ma.*

562. MCKAY, JOHN, 86 Collins-street west.—Colonial-made Fountain. *Des. Mod. and Ma.*

563. MCKENDRICK AND MCEWAN, 361 Spencer-street.—Cedar Bookcase. *Ma.*

564. MCKENNAL AND SCURRY, 94 Russell-street.—Cement Vases; Sketches for Fountains. *Des. and Ma.*

565. MCKENZIE, D., Punt-road, South Yarra.—Three Garden Chairs (Rustic). *Ma.*

566. MCLEAN, PETER, 79 Spring-street.—Tables, Chairs, &c., in Colonial Wood. *Des. and Ma.*

567. MCLEAN, ANGUS, Lothian-street, North Melbourne.—Carving and Mounting on Colonial Wood. *Des. and Ex.*

568. MCLENNAN AND CO., Castlemaine.—Six Pairs Socks, made from Colonial Wool, knitted at Castlemaine; one Pair Gloves, made from Wool plucked off the Sheep by a Shepherd with one Arm, knitted and spnn by him. *Ex.*

569. MCWILLIAMS, ANDREW, Geelong.—Detailed Survey Map of Parish of Barrabool, in four colors. *Des.*

570. MADDEN, WILLIAM, 141 Brunswick-street, Collingwood.—Devonport, of Colonial Wood, with Secret Drawers and Slides. *Ma.*

571. MARSH, S. D., 15 Collins-street.—Six Pieces of Music. *Com.*

572. MARSH, WILLIAM, 2 Swanston-street, Melbourne.—Panels in Illustration of Woods and Marbles. *Des. and Ma.*

573. MASON AND FIRTH, 16 Elizabeth-street.—Specimens of Printing and Stereotyping by Machinery. *Ex.*

574. MARTIN, CHARLES R., 2 Flinders-lane west. — Military Embroidery. *Ma.*

575. MAY, MISS C.—Crochet Work. *Ma.*

576. MEAKIN, HENRY, Derby Arms Hotel, Geelong. — Two Chalk Drawings *By Son of Ex.*

577. MEEK, J. M., 131 Johnston-street, Fitzroy.—Pen-and-Ink Drawing of the Map of Australia. *Des.*

578. MEMMOTT, WILLIAM, Waterloo-road, Collingwood.—Colonial-made Combs. *Ma.*

579. MILNE, WILLIAM, 67 Collins-street west. — Boots and Shoes, Colonial. *Ma.*

580. MILLS, A. D., 2 Swanston-street north, Geelong.—Bookbinding. *Ma.*

581. MITCHENER AND RICHARDSON, 24 Russell-street.—Window Blinds; Wire Work. *Ma.*

582. MONTGOMERY, RICHARD, 85 Smith-street, Collingwood.—Cork wood and Bungs. *Ma.*

583. MOORE, JOHN, Henry-street, East Collingwood.—Photographic Views and Maps. *Des.*

584. MOURANT, JOHN J., 71 Oxford-street east, Collingwood.—Wooden Taps, Shives, and Spiles. *Ma.*

585. MUELLER, DR. F., Botanical Gardens, Melbourne.—Wire and Leather Covers for drying plants; box containing Native Lichens, Bark of Sassafras, Atherosperma moschatum, and Acacia (Wattle) Bark; Collection of Native Grasses.

586. MUNICIPAL COUNCIL OF CASTLEMAINE.—A Series of 7 Photographic Views of Railway Works in the Vicinity of Castlemaine. *Pro.*

587. MURRAY, ——.—Case of Jewellery. *Ma.*

588. MURRAY FISHING COMPANY.—Murray Cod (Stuffed). *Ex.*

589. NETTLETON, CHAS.—Photographic Views. *Ex.*

590. NIGHTINGALE, E., 96 Russell-street.—1 Case of Colonial-made Bonnet Boxes. *Ma.*

591. NUTT, T. W., 179 Swanston-street.—Plaster Models, Ornamental Designs. *Des.*

592. O'BRIEN, JOHN, 10 Raglan-street, Hotham.—Penmanship. *Des.*

593. ORMEROD, LIONEL, Pakington-street, Newtown, Geelong.—Stereoscopic Views of Geelong and Suburbs. *Ex.*

594. OSBORN, J. W.—Photo-Lithographs. *Ex.*

595. Ovens Local Exhibition Committee.—Case of Stuffed Birds and Animals; Bottles containing Lizards, Snakes, &c., preserved and exhibited by the Rev. W. Corbet Howard, and P. Le Poer Bookey, Esq.; Platypus, by A. Keefer, Esq.; Flying Squirrel and Young One, by Mr. Phillips; Turtle and Tortoise Shells, by Mr. Worthington, Rutherglen; Native Porcupine, by Mr. Christopher Banon; Musical Diagram, by Mr. Barnard; Historical Design, by Mr. C. F. Mitchell; *Ovens and Murray Advertiser*, on satin, by Mr. Richard Warren; Photographic Views, by the Municipality. *Ex.*

596 Oxley, George W., Back Creek.—Talbot Volunteer Uniform, in Sydney Tweed; Portrait of Volunteer in Uniform. *Des. and Ma.*

597. Paser, Julius, 196 Little Bourke street east.—Billiard Table of Colonial Cedar. *Ma.*

598. Paul, James M., Back Creek.—1 case Miscellaneous Insects; 6 bottles Natural Curiosities. *Ex.*

599. Paulson, Anne, Castlemaine.—A series of 52 Original Drawings, from Native Bush Flowers. *Des.*

600. Perkins, Horace.—Framed and Glazed View of Castlemaine in 1860; Pencil Drawing, Scroll or Ornament. *Des.*

601. Permezel Brothers, Flinders-lane.—Eau de Cologne Fonntain, and Perfumery. *Ex.*

602. Perry, G. W., 5 Collins-street west.—Photographs produced by the Photographic Society of Victoria; Photographic Chemicals. *Ex.*

603. Pettit Brothers, 48 Little Bourke-street east.—Baskets, Willowware, and Perambulator. *Ma.*

604. Pewtress, Mrs. H. L.—Crochet Work. *Ex.*

605. Phonetic Society, Melbourne.—Specimens of Phonographic Shorthand. *Ex.*

606. Pietoiche, F., 18. Curzon-street, North Melbourne—Potichiomaine Chimney-piece of Blackwood; Vases. *Ma.*

607. Poole, Mrs. G. H., Williamstown.—Medallions in Wax of Burke and Wills. *Ex.*

608. Potts, Mrs. Robt., Blenheim-house, Fitzroy.—Vases; Lace, Baskets, and Wax Flowers; pair of Hand Screens. *Des. Pro. and Ma.*

609. Preshaw, W. J., Castlemaine.—Tomahawk, Native Skull, and Dog with One Eye. *Ex.*

610. Pritchard, James B., 26 William-street.—Articles from Fiji Islands. *Ex.*

611. Quarrel, ——.—Lithograph of Exhibition Building. *Ex.*

612. Quelch, Chas., Commercial-road, Prahran.—Tallow Candles. *Ma.*

613. Read, ——.—Painting (New Zealand Native). *Des.*

614. Rees, Mrs., Carlton.—Leather Work. *Ma.*

615. Richardson, Thomas, 153 Little Collins-street east.—Specimens of Engraving *Des.*

616. Rickards, F., 70 Bridge-road, Richmond.—Two Gothic Cheffoniers. *Des. and Ma.*

617. Riley, Thomas, 32 Lonsdale-street west.—Chess Table. *Ma.*

618. Robertson, John, 78 Lonsdale-street east.—Specimens of Colonial Feathers, Stockings, and Dyed Goods. *Ex.*

619. Robinson, J. C.—Oil Painting, by Short: "The Descent." *Des.*

620. Robinson, J. C. (Porter, Victorian Railways).—An Oil Painting. *Des.*

621. Robinson, Thos. W., 58 Fitzroy-street, Fitzroy.—Photographic Views of Buildings in Melbourne. *Des.*

622. Robotham, P., 27 Little Bourke-street.—Colonial Embossing. *Ex.*

623. Ross, John L., 95 Bourke-street west.—View of Werribee Encampment and Specimen of Lithography. *Des*

624. Saint, A. G., 85 Russell-street.—Ticket Printing, Glass Writing, Embossing. *Des.*

625. St. Paul Brothers, 7 Collins-street west.—Colonial-made Confectionery. *Ma.*

626. Sands, Kenny, and Co., Collins-street. — Stationery; various Account Books manufactured by them in the Colony; Books printed and published by them. *Ma.*

627. Sanson, H., Melbourne.—Wooden Chain and Padlock. *Ma.*

628. Sartorius, Henry, 101 Great Lonsdale-street east.—1 Charcoal Filter, for clarifying water, cold and hot liquids, with Cane and Tin Syphon; 1 ditto ditto; 8 with an Indiarubber Hose, with Mouth Piece; 1 ditto ditto; 4 in a Tin Box, for travelling. It is of Prussian origin, and designed by the exhibitor.

629. Schieblach, C., Back Creek.—80 lbs. Soap; 6 lbs. Candles. *Ma*

630. Schmidt Brothers, 31 Little Bourke-street.—Engraving on Stone. *Des.*

631. Schoenfeld, T.—Lithography. *Ex.*

632. Schuhkrafft and Howell, 178 Elizabeth-street.—Specimens of Lithography; Paper Bags. *Ma.*

633. Scott, Annie E., Royal Park.—"Syren of the Rhine," a Worsted Work. *Des.*

634. Settil, ——.—Willow and Basket Ware. *Ma.*

635. Shew, E. M., 29 Catherine-street, Richmond.—Drawing Apparatus. *Ma.*

636. Shipp, Thos.—Sieves and specimens of Wire Work. *Ma.*

637. SHORT, WILLIAM, JUN., 158 Brunswick-street, Fitzroy.—2 Oil Paintings. *Des.*

638. SKEATES AND SWINBOURN, 163 Bourke-street east.—Colonial manufactured Wood Work. *Ex.*

639. SLADE, G. AND Co., Eagle Foundry, East Collingwood.—4 Economic Cooking Ranges. *Des. and Ma.*

640. SMEATON, W. J., Skene-street, Newtown, Geelong.—Specimens of Penmanship. *Des.*

641. SMITH, E., Back Creek.—Hair Ball, taken from the Stomach of a Bullock by Exhibitor. *Ex.*

642. SMITH, GEORGE F., 94 Little Nelson-street, Williamstown.—Illuminated Penmanship. *Ex.*

643. SMITH, JOSEPH, 27 Little Collins-street east.—Specimens of Wire Work and Wire Cloth. *Ma.*

644. SMITHSON, SYDNEY, 65 Little Collins-street.—Card Basket made of the Colonial Swamp Reed. *Ma.*

645. SPAREY AND BRYANT, 5 La Trobe-street east.—Samples of Corrugated and Galvanized Metallic Manufacture. *Ex.*

646. STEVENS, J. P.—1 Boot. *Ma.*

647. STEWART, MRS., Preston-street, Ashby, Geelong.—Colonial made Stays. *Ma.*

648. STOKES, THOMAS, 100 Collins-street east.—Specimens of Electro-Plating and Military Buttons. *Des. and Ma.*

649. STRUTT, W., Gore-street, Collingwood.—Portrait of the late Colonel Neil. *Ex.*

650. SUMMERS, C., Collins-street.—Design for the Seal of the Commission. *Des. and Ex.*

651. SWINBORN, JAMES, MRS., Nelson-street, Windsor.—Colonial-made Stays and Surgical Belts. *Ma.*

652. SWEETMAN, ——.—Specimen of Penmanship. *Ex.*

653. SYMONS AND HOWES.—Yeast Powder. *Ma.*

654. TALLERMAN, D., Napier-street, Collingwood.—Waterproof Hose and Clothes. *Inv. and Ma.*

655. TALLETT, T.—Flowers Sculptured in Marble. *Ex.*

656. TAYLOR, JOHN, 11 Little Bourke-street east.—Imitations ot Wood and Marble on Wood and Glass. *Des.*

657. TEALE, G., 107 William-street.—A Book showing Relative Varieties and Value of Paper. *Ex.*

658. TELFER AND FLEMING, 65 Bourke-street west.—Case of Colonial Jewellery. *Ma.*

659. TENNANT, H. E., 50 Little Bourke-street east.—Specimens of Engraving and Lithography. *Ex.*

660. Terlecki, F., Lygon-street, North Melbourne.—Carved Frame, and Wood Carvings. *Ma.*

661. Thomas and Murphy, 31½ Bourke-street west.—3 pairs of Boots. *Ma.*

662. Thomas, Wm., Protector of Aborigines.—A Kur-ber-er, or Australian Bear; 1 Tar-nuk, or Native Bucket. *Ex.*

663. Thomas, Miss, Richmond.—Bust of A. Barnett, Esq., M.B.J.P., Sandhurst, formerly Hon. Secretary to the Metropolitan Sanitary Association of London. *Des. and Mod.*

664. Thomas, Miss, Richmond.—Figure in Plaster: "Napea." *Des. and Mod.*

665. Tocknell, William, 41 Swanston-street.—Case containing Shells, Seaweed, and Petrified Leaves, &c. *Des.*

666. Tolhurst, ——, St Kilda.—Manuscript Music. *Com.*

667. Turner, W. J., Beechworth.—Case Colonial Jewellery and Gems. *Ma. and Ex.*

668. Turner, Joseph, 48 Queen-street.—Specimens of Fancy Leather Work. *Ma.*

669. Twentyman, G. O., 24 Collins-street west —Seal Engravings. *Ex.*

670. Usher, George F. (late Button and Co., J. G.), 166 Lonsdale-street east.—1 Horsehair Mattress, and 1 pair of Straw Palliasses. *Ma.*

671. Vanheens, H , Kilmore.—Photographs.

672. Vickers, Joseph, Collingwood.—A Seine Net, 206 yards long. *Ma.*

673. Vickers, Mrs., Collingwood.—Knitted Curtain. *Ma.*

674. Walker, May, and Co., 99 Bourke-street east.—Specimens of Electrotyping and Stereotyping. *Ex.*

675. Wallworth, Smith, 18 Bourke-street east.—Gentlemen's Hats, Army Caps, Busbies, and Helmets. *Inv. and Ma.*

676. Walsh Brothers, Collins-street, Melbourne.—Gold Vase, on Blackwood Pedestal, with Panels of Malachite and Marble. *Ex.*

677. Ward, T., 223 Swanston-street.—Soap Powder. *Ma. and Inv.*

678. Warwick, Henry.—Cork Boots, for Deformities. *Ma.*

679. Watts, Henry, Warrnambool.—1 book Seaweeds, collected in Warrnambool; 1 box containing Microscopic Objects. *Ex.*

680. Werner, Emil, Elsternwick.—Sample of Soft Soap, made from Fish Oil and Potash. *Ma.*

681 West, Mrs. E. H., Drummond-street, Carlton.—9 Drawings and Designs in Water Colors. *Ex.*

682. Westall, Mrs. W.—Wax Flowers. *Ex.*

683. WHITCHELL AND Co., Geelong.—Boots, in all the stages of Manufacture. *Ma.*

684. WHITEHEAD, SEN.—Oil Paintings. *Ex.*

685. WHITEHEAD, ISAAC, 73 Great Collins-street east.—Wall Decorations in bas relief; Picture Frames; Decorative Furhiture, &c. *Des. and Ma.*

686. WHITFIELD, JOSEPH, 17 Little Bourke-street.—Colonial Cutlery. *Ma.*

687. WHITELAW, THOS., per S. K. BAIRD AND Co., Ballaarat.—Specimen of Grained Pollard Oak, Satin Wood, &c. *Ex.*

688. WHITELAW, DAVID, Moray-street, Emerald Hill.—Model of Conservatory and Flower Garden. *Des and Ma.*

689. WILCOX, JOHN, 31 Napier-street, Fitzroy.—Eight pieces Spiral Turning; Hatters' sunk Frame; Five-piece Blocking ditto; Brow-frame, and Brow fitted to same; Volunteers' Cap Block; Deerstalker's Block; Ladies' Curl Block; Violet Block and Head Block for ditto (Australian wood). *Ma. and Ex.*

690. WILKIE, F.—Specimens of Shell Work. *Ex.*

691. WILKIE, JOSEPH, 18 Collins-street.—6 frames containing Specimens of Colonial Musical Composition, engraved, printed, and lithographed in colors; Portfolios, containing Specimens of each copy of Music published by above. *Ex.*

692. WILKIE, MRS. S.—Seaweeds. *Ex.*

693. WILKINSON, ALFRED, 126 La Trobe-street west.—Model of St. Paul's Church. *Ma.*

694. WILLIAMS, A. M., 13 Malop-street, Geelong.—Map of the Parish of Barrabool, in the County of Grant. *Des. by Ex.*

695. WILLIAMS, ADELINE (a blind girl).—Crotchet Work. *Ma.*

696. WILLIAMS, ——, Collins-street.—Photographs: Portraits. *Ex.*

697. WILSON AND MACKINNON.—2 vols. of the *Argus*, 7 vols. of *Hansard*. *Ex.*

698. WILSON, MRS. H., 47 Swan-street, Richmond.—Fire Screen in Leather. *Des and Ma.*

699 WINSTON, C. E., 42 Collins-street east.—Frame of Colonial Wood Engraving. *Ex.*

700. WIPER, JOHN, opposite 79 Little Collins-street east.—Specimens of Cut, Bent, and Blown Glass. *Ma.*

701. WOOD, W.—11 cases of Stuffed Birds. *Ex.*

702. WOOD, W. J., Toorak.—Sample Colonial-made Blacking. *Ma.*

703. WRIGHTSON, A.—2 Photographs in Frames. *Ex.*

AWARDS OF JURORS.

CLASS I.

FIRST-CLASS CERTIFICATE.

No. of Exhibit.

33. Smith and Son, Messrs., Collingwood.—Machine and Fancy Biscuits.

1. Aitkin, Thomas, Melbourne.—Bulk Ale.

3. Barmby and Verity, Messrs., Richmond.—Smoked Beef Ham.

32. Smith, Brothers, Messrs., North Melbourne.—Glasgow Beef Ham.

22. Johnson, J., Gipps Land.—Salted Beef.

7. Cox, W. S., Bourke-street.—Spiced, Rolled, and Dried Bacon.

30. Ramsden, S., Carlton.—Flour.

23. Lansdell, S., Melbourne.—Potato Flour.

18. Gough and Co., Messrs., Richmond.—Malt, No. 1.

34. Swallow, T. and Co., Messrs., Sandridge.—Ship and Cabin Biscuits.

4. Bencraft, G., Melbourne.—Oatmeal.

27. McKenzie, J. and Co., Messrs., North Melbourne.—Pease Meal.

4. Bencraft, G., Melbourne.—Groats.

4. Bencraft, G., Melbourne.—Maize Meal.

30. Ramsden, S., Carlton.—Bran.

21. Hodges, Mrs., Brunswick.—Honey, taken 1856 and 1861; Mead.

27. McKenzie, J. and Co., Messrs., North Melbourne.—Ground Spices.

27. McKenzie, J. and Co., Messrs., North Melbourne.—Ground Coffee.

27. McKenzie, J. and Co., Messrs., North Melbourne.—Colonial grown Chicory.

SECOND-CLASS CERTIFICATE.

No. of Exhibit.

28. MURCUTT, TERRY, AND CO., MESSRS., Melbourne.—Bulk Ale.
18. GOUGH AND CO., MESSRS., Richmond.—Malt, Nos. 3 and 4.
19. GUEST AND CO., MESSRS., William-street.—Ship and Cabin Biscuits.
27. MCKENZIE, J. AND CO., MESSRS., North Melbourne.—Oatmeal.
5. BIGNELL AND EDOLS, MESSRS., Bourke-street.—Salted Beef.

HONORABLE MENTION.

13. ELLIOT AND FAWNS, MESSRS., Sandhurst.—Bulk Ale.
26. WALLACE, JOHN, Beechworth.—Colonial Ale (bottled).
5. BIGNELL AND EDOLS, Bourke-street.—Dried Beef, Tongues, Sausages, Hams, and Preserved Meats.

CLASS II.

FIRST-CLASS CERTIFICATE.

90. VICTORIA SUGAR COMPANY, Sandridge.—For Sugars, Rum, Treacle, and Spirits of Wine.
59. FORDHAM, F., Emerald Hill.—Bottled Fruits, Assorted Jams, Marmalade.
98. CHUCK, THOMAS, St. Kilda.—Fibrous Materials: Cotton.

LIDDY, JAMES, Little Collins-street.—Specimen of Cotton grown at Heathcote.

39. BARKER, J. AND R., MESSRS., Collingwood.—Case of Silk, from Silkworms fed on Black Mulberry at Cape Schanck.
48. CROPPER, W. H., Melbourne.—Silk grown at St. Kilda, and wound by hand from dry cocoons.
79. SADLER, THOMAS, St. Kilda.—Silk from Silkworms reared at Caulfield.
45. COATES, DR., South Yarra.—Dye obtained from the Coccus Insect on the Blue Gum, Eucalyptus Globulus.
70. LOUGHNAN AND CO., MESSRS., Melbourne.—Tobacco Leaf.
67. LEE, PHILLIP, St. Kilda.—Cigars of Colonial Manufacture.
52. DIXON, P. G., Melbourne.—Ginger Wine, Ginger Brandy, Orange Bitters, Lemon Syrup, Lemonade, Soda Water.
93. WILSON AND CO., MESSRS., Webb-street, Fitzroy.—Peppermint.

No. of Exhibit.

51. Dickson, James, Melbourne.—Cherry Cordial.

93. Wilson and Co., Messrs., Fitzroy.—Cherry Brandy.

85. Simpson, George, Melbourne.—Sarsaparilla.

66. Kruse, J. and Co., Messrs., Melbourne.—Mineral Waters, 6 sorts.

49. Dardanelli, ——, Melbourne.—Silk from Cocoons fed on Black Mulberry leaves, by Miss S. King.

77. Prévôt and Co., Messrs., Melbourne.—Ginger Beer.

SECOND-CLASS CERTIFICATE.

86. Stewart, Robt., Geelong.—Assorted Jams.

93. Wilson and Co., Messrs., Fitzroy.—Ginger Wine.

51. Dickson, James, Melbourne.—Ginger Brandy.

85. Simpson, George, Melbourne.—Peppermint.

51. Dickson, James, Melbourne.—Orange Bitters.

52. Dixon, P. G , Melbourne.—Cherry Cordial.

52. Dixon, P. G., Melbourne.—Sarsaparilla.

77. Prévôt and Co., Messrs., Melbourne.—Lemonade.

77. Prévôt and Co., Messrs., Melbourne.—Soda Water.

HONORABLE MENTION.

77. Prévôt and Co., Messrs., Melbourne.—Curaçoa and Maraschino.

59. Fordham F., Emerald Hill.—Tomato Sauce.

Reynolds, M., Swanston-street.—Garden Seeds.

Caulfield, E., Toorak.—Olive Oil.

Chuck, Thos., St. Kilda.—Collection of Fibrous and Dyeing Materials.

Mears, J. and A., Collingwood.—Medicinal Herbs (local growth).

48a. Crompton, ——.—Cigars from Native Tobacco.

72. McMillan, A., Brighton.—Brandy.

Kruse, J., Melbourne.—Sugar of Sorghum.

85. Simpson, George, Melbourne.—Ginger Brandy.

77. Prévôt and Co., Messrs., Melbourne.—Orange Bitters.

93. Wilson and Co., Messrs., Fitzroy.—Punch.

WINES.

FIRST-CLASS CERTIFICATE.

No.	Exhibitor.	Name of Wine.	Year.	Value.
	RED WINES.			
57	Everist, T. J. Melbourne ...	Carignan ...	1860	First.
58	Fallon, J. F., Albury... ...	Scyras	1858	Second.
74	Mate and Co., Albury ...	Hermitage ...	1861	Third.
58	Fallon, J. F., Albury... ...	... ...	...	Fourth.
	WHITE WINES.			
58	Fallon, J. F., Albury... ...	Verdeillio ...	1860	

SECOND-CLASS CERTIFICATE.

No.	Exhibitor.	Name of Wine.	Year.	Value.
	RED WINES.			
73	MacMullan, W., Geelong ...	Burgundy ...	...	First.
75	Niffenecker Brothers, Geelong...	Hermitage ...	...	Second.
53	Dumont, Louis, South Yarra ...	Hermitage ...	...	Third.
58	Fallon, J. F., Albury... ...	Scyras ...	1859	15·5
64	Hirschi, F., Castlemaine ...	Mount Alexander	...	11·6
57	Everist, T. J., Melbourne ...	Mataro ...	1859	11·5
57	Everist, T. J., Melbourne ...	Mataro ...	1860	10·7
58	Fallon, J. F., Albury... ...	... ...	...	10·2
41	Brequet, F., Geelong... ...	R. Neufchatel ...	1861	10·0
74	Mate and Co., Albury ...	Brown Muscat ...	...	10·0
	WHITE WINES.			
58	Fallon, J. F., Albury... ...	Verdeillio ...	1859	First.
57	Everist, T. J., Melbourne ...	Gonais ...	...	Second.
80	Sanger, J. M., Albury ...	Reisling ...	1860	Third.
80	Sanger, J. M., Albury ...	Reisling ...	1858	13·2
80	Sanger, J. M., Albury ...	Aucarot ...	1860	13·0
54	Dunoyer, J., Geelong ...	Pinean Gris ...	...	11·8
41	Breqnet, F., Geelong... ...	Sauterne ...	...	11·0
88	Tuckett, W. H., St Kilda ...	... ...	...	11·0
50	De Castella and Anderson, Yering	Yering ...	...	10·9
50	De Castella and Anderson, Yering	Yering ...	...	10·7
50	De Castella and Anderson, Yering	Yering ...	...	10·6
64	Hirschi, F., Castlemaine ...	Mount Alexander	1861	10·5
91	Wanke, G.	Chablis ...	...	10·5
74	Mate and Co , Albnry ...	Reisling ...	...	10·2
80	Sanger, J. M., Albnry ...	Reisling ...	...	10·0
74	Mate and Co., Albury ...	Aucarot ...	1861	10·0

WINES—*continued.*

HONORABLE MENTION.

No.	Exhibitor.	Name of Wine.	Year.	Value.
	RED WINES.			
68	Lemme and Co., Castlemaine ...	R. Castlemaine ...	...	9·2
62	Grosmann, Melbourne ...	Hermitage ...	...	8·7
80	Sanger, J. M., Albury ...	Scyras and Malbec	1859	8·3
50	De Castella and Anderson, Yering	Yering ...	...	7·7
41	Brequet, F., Geelong ...	R. Burgundy ...	1861	7·5
38	Anduske, S., Geelong ...	Espar	...	6·7
40	Bieske, S., Geelong	Espar	...	6·7
58	Fallon, J. F., Albury... ...	Carbinet ...	...	6·5
89	Upston, Robert, Geelong ...	Burgundy ...	1858	6·3
92	Weber Brothers, Batesford ...	Burgundy ...	1860	6·0
83	Seidel, B, Geelong	Burgundy ...	...	5·7
81	Schneider, J., Nunawading ...	Frontignac ...	...	5 0
	WHITE WINES.			
50	De Castella and Anderson, Yering	Yering ...	1859	9·7
38	Anduske, S., Geelong ...	Madeira ...	...	9·6
73	MacMullan, W., Geelong ...	Sauterne ...	1861	
63	Henty, James, Richmond ...	Victoria ...	...	8·5
58	Fallon, J. F., Albury... ...	Mixed Grapes ...	1860	8·4
40	Bieske, S, Geelong	Madeira ...	...	7 8
53	Dumont, Louis, South Yarra ...	Pineau Blanc ...	...	7·6
37	Abel, A. T., Ballaarat ...	Colonial ...	...	7·1
74	Mate and Co., Albury ...	Tokay ...	1861	7·0
74	Mate and Co., Albury ...	Muscat of Alexandria	1861	7·0
37	Abel, A. T., Ballaarat ...	Colonial ...	...	6·3
58	Fallon, J. F., Albury ...	Reisling ...	...	5·7
92	Weber Brothers, Batesford ...	Sweet Water ...	...	5·6
92	Weber Brothers, Batesford ...	Chasselas ...	1860	5·2

N.B.—The maximum number to be given to the best Wine was fixed by the Jurors at 20. The numbers descend according to the quality of the Wine, as estimated by the Jurors.

CLASS III.

FIRST-CLASS CERTIFICATE.

No. of Exhibit.

114. Sandhurst Local Committee.—Samples of Timber from that Locality.

Bosisto, J., Richmond.—Samples of Oils from various Native Trees.

Johnson, W., St. Kilda.—Samples of Oils from the Eucalyptus leaves.

No. of Exhibit.

113. PRAAGST, G. W., Williamstown.—The residue from Wood, Leaves, &c., obtained in manufacture of Vegetable Gas.

CHAMP, W., ESQ., Pentridge.—Cabbage-tree Hats.

BACKHAUS, REV. MR., Sandhurst.—Specimens of Ironbark Timber.

118. WATTS, H., Warrnambool.—Specimens of Microscopic Objects and Seaweeds.

103. GRAY, H., Ballaarat.—Sample of Oil of Eu. Amygdalina and for the Residual Products of the destructive distillation of the Eu. Gunnii.

HONORABLE MENTION.

OVENS LOCAL COMMITTEE.—Sections of Callitris Pine from that neighborhood.

ALLITT, W., Portland.—Specimens of Colonial Woods.

BEVERIDGE, P.—Specimens of Colonial Woods.

LEVY BROTHERS, Melbourne.—Specimens of Colonial Woods.

McHAFFIE, J., Phillip Island.—Specimens of Colonial Woods.

ROGERS, J., Western Port.—Specimens of Colonial Woods.

HAYTER, H. H.—For his discovery of the Fibrous Material of the Cryptostemma Calendulaceum.

CONNOR, ——, Bunyip Creek.—Sample of Grass-tree Gum.

105. HOLDSWORTH, ——, Sandhurst.—Sample of Pyroxylic Spirit.

McKENZIE, ——, Swan Hill.—Net made of the Cyperus Vaginatus, or Murray Sedge.

96. BAXTER, ANNE, Hotham.—Seaweed.

109. MERCER, MRS. G., Geelong.—Seaweed.

CLASS IV.

FIRST-CLASS CERTIFICATE.

123. BANK OF AUSTRALASIA, Melbourne.—For a Collection of characteristic Samples of Alluvial Gold, of great beauty.

126. BANK OF NEW SOUTH WALES, Melbourne.—For a Collection including very instructive Specimens and Examples of the mode of occurrence of Gold in the Matrix.

No. of Exhibit.

128. Bank of Victoria, Melbourne.—For a Collection of Specimens, for the most part Alluvial, from the several Gold Fields, including Samples from, and Illustrations of, the working of the co-operative Companies of Ballaarat.

132. Benyon, ——, Esq.—For the exhibition of Gold Specimens of unique character.

172. Lewis, J., Whroo.—For Gold Specimens from Whroo.

184. Ovens Local Committee.—For their Collection of Gold and Auriferous Quartz and other Minerals, including a Diamond.

164. Inglewood Local Committee.—For its Collection.

127. Bank (Oriental), Melbourne.—For its Collection.

224. Bank (English and Scottish), Melbourne.—For its Collection of Specimens.

209. Walshe, B., Heathcote.—For a Massive Example of Antimony Ore, and for a large Specimen of Jasperoid Conglomerate.

187. Polkinghorne, ——, Sandridge.—For his example of Colonial Tin, Smelting, and other illustrations.

205. Victorian Coal Company, Messrs. Levy and Sons, Melbourne.—For Specimen of Coals.

121. Abel, A. T., Ballaarat.—For a Mass of Meteoric Iron, from Cranbourne, of the greatest interest and of magnificent dimensions. From a scientific point of view this is the most important of our mineral contributions.

130. Bates, W., Melbourne.—For a Diamond in the natural state.

667. Turner, J. W., Beechworth.—For specimens of Agates, Jaspers, and other Ornamental Stones.

174. MacDonald, Kenneth, Wyckliffe.—For examples of Salt manufacture, from Works near Wyckliffe.

141. Cawkwell, H. A., Gardiner.—For his samples of Glazed Drain Pipes, Terra Cotta Gothic Details, &c.

149. Downe, W. B., Castlemaine.—For samples of Bricks and other Building Materials produced at Castlemaine.

160. Hirschi, F., Castlemaine.—For Glazed and Unglazed Pottery.

157. Gray, Wm., Phillipstown.—Samples of Bricks and Drain Pipes.

190. Rangier, V.—For Glazed Red Earthenware.

Smith, A. K., Melbourne.—For example of machine-dressed Stone.

136. Cakebread, G., Geelong.—For samples of Geelong Limestone.

No. of Exhibit.

150. Dyer and Co., Messrs., Melbourne.—For samples of Limestone.

168. Knight, J. G., St. Kilda.—For a comprehensive collection of samples of Building Stones, &c.

206. Victorian Kaolin Company, Melbourne.—For a comprehensive series of illustrations of the applications to which Kaolin may be applied.

166. Ker, R., Esq., Western Port.—For a Sample of Red Granite.

197. Sandhurst Local Committee.—For samples of Granite from the vicinity of Sandhurst.

146. Coop, Jas., Melbourne.—For excellent samples of Lead Piping of Victorian manufacture.

153. Foord, G., Elizabeth-street.—For case of Minerals associated with Gold, and for specimen of Meteoric Iron, beautifully cut in section to show its structure.

SECOND-CLASS CERTIFICATE.

198. St. Mungo Quartz Company, Bendigo.—For specimens of Quartz and Gold.

173. Malakhoff Claim, Steiglitz.—For a sample of Auriferous Sulphides.

135. Burkitt, A. H., Beechworth.—For illustrations of the mechanical separation of Black Sand (Alluvial Tin Oxide).

133. Bligh and Harbottle, Messrs., Melbourne.—For massive specimens of Antimony Ore.

139. Cape Patterson Coal Company, Melbourne.—For Coal from Cape Patterson, Western Port.

159. Hall, J., Emerald Hill.—For samples of Iron Ore from Sandhurst, with tentative examples of Smelting.

162. Hodgkinson, Wm., Prahran.—For samples of Bricks and Tiles.

151. Emery, M., Preston.—For samples of Pottery and Drain Pipes.

170. Lawson, W., Melbourne.—For samples of Salt manufactured from the Water of Hobson's Bay.

193. Roberts and Jones, Castlemaine.—For sample of Paving Slate.

131. Beechworth Local Committee.—For samples of Granite from Beechworth, including varieties applicable to internal decoration.

178. Moss, W., Melbourne.—Asphalte.

HONORABLE MENTION.

No. of Exhibit.

176. MITCHELL, A., Avoca.—For Gold Specimens.
179. MURPHY AND LEPLASTRIER, Melbourne.—For their exhibit of Iron Ore.
142. CLARK, W. J., Melbourne.—For a large Flower Vase.
138. CASTLEMAINE COMMITTEE.—For samples of Building Stones.
122. BACK CREEK COMMITTEE —For a collection of Minerals.
137. CAMPBELL, ——, Back Creek.—For Mineral Specimens.
158. GREEN, P. J., Castlemaine.—For specimens of Fossil Graptolite.
177. MORGAN, J. R., Back Creek.—For Mineral specimens and samples.
183. O'MEARA, MARTIN, Castlemaine.—For Quartz and other specimens.
185. PERKINS, H., Castlemaine.—For Specimens of Quartz and other minerals.
201. SHANKLIN, R.—For specimens of Victorian Marble.
203. TUCKETT, ——, Bet Bet.—For Limestone from Bet Bet.
207. VICTORIAN REEF GOLD MINING COMPANY, Bendigo.—For modelled section of Gold Mine.
195. RODDA, R. V., Port Phillip Club Hotel.—For specimen in illustration of process applicable to the treatment of poor ores.

CLASS V.

FIRST-CLASS CERTIFICATE.

217. ACKRILL AND Co., Melbourne.—Fixing Bricks and Keys.
230. BURMEISTER, LEOPOLD, Melbourne.—Turret Clock.
229. BUNCLE, JOHN, Melbourne.—Agricultural Implements.
258. GRIMOLDI, J., Melbourne.—Barometric and Thermometric Instruments.
259. GUYATT, GEORGE, Melbourne.—Surgical Instruments.
263. HEATH AND JACKSON, MESSRS., Geelong.—Model of a Yacht.
270. KAY, J. A., Melbourne.—Sewing Machines.

No. of Exhibit.

271. Knight, G. W., Sunbury.—Railway Ballast Waggon.

289. Murray and Co., Messrs., Melbourne.—Telltale Clock.

296. Perry, C. J. C., Williamstown.—Anti-collision Dial.

308. Schreiber, Henry, Melbourne.—Meteorograph.

316. Steiling, George, Richmond.—Flower Pots, Fire Bricks, Milk Pan, and Jam Pots.

319. Thomas, William, South Yarra —Model of a Yacht.

334. Wilson, Donald, Melbourne.—Double-seated Buggy.

332. Wilkie, Joseph, Melbourne.—Piano.

311. Smith, Joseph, Melbourne.—Separator for Cleaning Grain.

264. Henderson and Bett, Messrs., South Yarra.—Iron Swing Plough.

329. White, G. and P., Messrs., Melbourne.—Brass Cocks and Lever Unions.

233. Cairns, Wilson, and Amos, Carron Iron Yards, Melbourne.—Colonial Bar Iron and Antimony.

SECOND-CLASS CERTIFICATE.

224. Bobardt, Otto, Melbourne.—Mathematical Instruments.

228. Brown, William, Fitzroy.—Road Scraper.

292. Nicholas, H. C., St. Kilda.—Six-stop Harmonium.

315. Stephen, John, Melbourne.—Model of a Powerful Pump.

333. Williams, W., Melbourne.—Carriages.

249. Ferguson, Charles, Williamstown.—Life-Boat.

280. McIntosh, D. M., Footscray.—Railway Sleepers.

HONORABLE MENTION.

221. Anderson, Sharp, and Wright, Messrs, Melbourne.—Chimney Piece.

227. Brown, Walter, Melbourne.—Self-heating Gas Iron.

241. Dods, B. H., and Co., Messrs., Melbourne.—Hydraulic Engine.

260. Hackett and Co., Messrs., Collingwood.—Albert Car with Patent Head, Circular Back and Front.

272. Lambert and Curtis, Messrs., Collingwood.—Gratings for Stamper Boxes.

285. Mathieson, James, Melbourne.—Masons' Tools.

No. of Exhibit.

281. Maclean, A., Melbourne.—Pumps.

293. Nicoll, David, Melbourne.—Saw-set.

290. Newman, S. C., Collingwood.—Screwing Tackle.

313. Stevens, G., Prahran.—Pianoforte Keyboard.

274. Langlands Brothers, Melbourne.—Steam Engine (Donkey).

305. Robison, William, Melbourne.—Brass Pump.

CLASS VI.

PURE BRED MERINO WOOLS.

FIRST FIRST-CLASS CERTIFICATE.

365. Lot 1. T. and S. Learmonth, Messrs., Ercildoun, Burrumbeet.—Washed Fleece Wool.

365. Lot 10. T. and S. Learmonth, Messrs., Ercildoun, Burrumbeet.—Washed Rams' Fleece.

FIRST-CLASS CERTIFICATE.

374. Lot 9. W. Skeene, Esq., Hamilton.—Washed Fleece Wool.

360. Lot 11. R. Goldsbrough and Co., Melbourne.—Washed Fleece Wool.

SECOND-CLASS CERTIFICATE.

366. Lot 2. T. McKellar, Esq., Kanawalla, Hamilton.—Washed Fleece Wool.

350. Lot 4. J. L. Currie, Esq., Laree, Cressy.—Washed Fleece Wool.

CROSS BRED WOOLS.

FIRST-CLASS CERTIFICATE.

373. T. Russell, Esq., Plains, Shelford.—Cross Bred Wool.

SECOND-CLASS CERTIFICATE.

372. P. Russell, Esq., Carngham.—Cross Bred Wool.

HONORABLE MENTION.

373. T. Russell, Esq., Plains, Shelford.—Cross Bred Wool.

371. E. Row, Esq., Melbourne.—Half Bred Wool, being first cross between Merino and Cotswold.

GREASY WOOL.

No. of Exhibit.

FIRST FIRST-CLASS CERTIFICATE.

365. Lot 7. T. AND S. LEARMONTH, MESSRS., Ercildoun, Burrumbeet.—Greasy Fleece Wool.

FIRST-CLASS CERTIFICATE.

350. Lot 5. J. L. CURRIE, Esq., Laree, Cressy.—Greasy Fleece Wool.

350. Lot 3. J. L. CURRIE, Esq., Laree, Cressy.—Greasy Fleece Wool.

SECOND-CLASS CERTIFICATE.

377. Lot 6. WILSON BROTHERS, MESSRS., Ashens, Glenorchy. —Greasy Fleece Wool.

SCOURED WOOLS.

FIRST-CLASS CERTIFICATE.

347. CORRIGAN, S. B., ESQ., Geelong.—Scoured Combing Wool.

347. CORRIGAN, S. B., ESQ., Geelong.—Scoured Clothing Wool.

347. CORRIGAN, S. B., ESQ., Geelong.—Scoured Lambs' Wool.

SECOND-CLASS CERTIFICATE.

354. DOUGLAS, A. AND CO., MESSRS., Geelong.—Scoured Wool.

HONORABLE MENTION.

368. MARSHALL, T., ESQ., Geelong.—Scoured Wool. This sample highly commended.

FIRST-CLASS CERTIFICATE.

346. CLARK, J., Elizabeth-street.—Rough Tanned and Sole Leather.

375. SMITH, W., South Yarra.—Rough Tanned and Sole Leather.

343. BREARLEY BROTHERS, MESSRS.—Rough Tanned and Sole Leather.

346. CLARK, J., Melbourne.—Dressed curried Shoe Leather, grained and waxed calf; Dressed curried shoe leather, grained kip; Dressed and curried shoe leather, waxed and brown kangaroo; Dressed harness leather, three splendid hides, one weighing 48 lbs., beautifully tanned, curried, and managed; 1 brown collar hide; Dressed saddle leather, curried; Tanned skins in hair.

No. of Exhibit.

358. Fitts, C., Sandridge.—Colonial-made Glue.

355. Downie and Murphy, Messrs., Melbourne (Hobson's Bay Soap and Candle Company).—Bleached and Mixed Tallow.

379. Woodward, G., Kew.—Victoria Patent Guano, or Deodorized Nightsoil.

Jeffery, J., Toorak.—Arrowroot, colonial grown.

Docker, Rev. J., Wangaratta.—Arrowroot, colonial grown.

341. Bignell and Edols, Melbourne.—Trotter and Neatsfoot Oil.

369. Mud Island Guano Company, Melbourne.—Guano.

367. Macmeikan, J., and Co., Flemington.—Horns, Hoofs, Shank bones, Glue pieces, and Super-phosphate of Lime.

376. Williamson, John, Collingwood.—Curled Hair.

SECOND-CLASS CERTIFICATE.

364. Kitchen and Sons, Sandridge.—Bleached and Mixed Tallow.

343. Brearley Brothers, Geelong.—Dressed Curried Shoe Leather; Dressed harness leather, curried.

342. Boehm, John.—Soap.

HONORABLE MENTION.

345. Bullock, R. N., Geelong.—Lady Julia Percy Island Cave Guano.

CLASS VII.

FIRST-CLASS CERTIFICATE.

630. Schmidt Brothers, Melbourne.—Engravings on Stone.

615. Richardson, T. W., Melbourne.—Engravings.

548. Ligar, C. W., Melbourne.—Lithographs.

456. De Gruchy and Leigh, Melbourne.—Lithographs.

594. Osborn, J. W., Melbourne.—Photo-lithographs.

560. McDonald, ——, Melbourne.—Daguerreotypes.

390. Batchelder and O'Neill, Messrs., Melbourne.—Photographs and Volunteer Groups.

No. of Exhibit.

602. Perry, G. W., Melbourne.—Photographs: Single portraits.

450. Daintree, H., Melbourne.—For a beautifully-executed collection of Panoramic and other Photographs, illustrating the Geological Features of the Country, its Rocks and Fossils.

506. Haigh, Edward, South Yarra.—Photographs: Views.

446. Cox and Luckin, Messrs.—Photographs: Buildings.

674. Walker, May, and Co., Messrs., Melbourne.—Stereotypes and Electrotypes.

388. Arnoldi, X., Melbourne.—Engraving on Steel.

669. Twentyman, G. O., Melbourne.—Seal Engraving.

548. Ligar, C. W., Melbourne.—Model of the Colony of Victoria in Plaster.

564. McKennel and Scurry, Messrs., Melbourne.—Models of Fountains.

663. Thomas, Miss, Richmond.—Bust of Dr. Barnett.

577. Meek, J. M., Fitzroy.—Tablet of Australia.

642. Smith, G. F., Williamstown.—Illuminated Writing.

687. Whitelaw, Thomas, Ballaarat.—Imitations of Wood.

432. Clarson, Shallard, and Co., Messrs., Melbourne.—Printing.

478. Ferres, J., Melbourne.—Printing.

626. Sands and Kenny, Messrs., Melbourne.—Account Books.

458. Detmold, W., Melbourne.—Bookbinding.

478. Ferres, J., Melbourne.—Bookbinding.

645. Sparey and Bryant, Melbourne.—Samples of Corrugated and Galvanized Metallic Manufacture.

668. Turner, J., Melbourne.—Despatch Boxes, Portfolios, and improved Bankers' Bill Case, Pocket Books, Card Cases, &c.

608. Potts, Mrs. Robt., Fitzroy.—Lace.

608. Potts, Mrs. Robt., Fitzroy.—Hand Screens.

509. Hancke, Miss, Richmond.—Artificial Flowers.

427. Christian, H., Kew.—Colonial-made Halters.

523. Hollings and Chambers, Messrs., Melbourne.—Woollen Flock.

424. Champ, W., Pentridge.—Coir Matting.

502. Grenier and de Tourette, Messrs., Melbourne.—Boots and Shoes.

No. of Exhibit.

431. Clark and Bedford, Messrs., Melbourne.—A Sans Pli Shirt.

402. Bickerton, R. F., Melbourne.—Hats and Caps.

536. King, Ellen, Brunswick-street.—Straw Bonnets and Hats.

455. De Courtet, Madame, Melbourne.—Stays.

380. Alcock and Co., Messrs., Melbourne.—Myrtle and Blackwood Billiard Tables.

563. McKendrick and McEwan, Messrs., Melbourne.—Cedar Bookcase.

567. Maclean, A., North Melbourne.—Wood Carving.

424. Champ, W., Pentridge.—Inlaid Fire Screens, &c.

578. Memmott, William, Collingwood.—Colonial-made Combs.

643. Smith, J., Melbourne.—Wirework.

636. Shipp, Thomas, Melbourne.—Fine-wove Wirework.

634. Settil, ——.—Willowware.

658. Telfer and Fleming, Messrs., Melbourne.—Jewellery.

654. Tallerman, D., Collingwood.—Waterproof Hose and Clothes.

545. Leviny, Ernest, Castlemaine.—Gold and Silver Smiths' Work and Jewellery.

467. Edwards, W., Melbourne.—Silver Plate.

537. Kitchen and Sons, Sandridge.—Soap.

401. Beechworth Local Committee.—Soap.

464. Downie and Murphy, Messrs., Melbourne.—Marbled Soap.

612. Quelch, Charles, Prahran.—Candles and Dip Candles.

495. Giraud, L., Collingwood.—Liqueur Confectionery.

558. McCoy, F., North Melbourne.—Six cases Australian Insects.

441. Cook and Fox, Messrs., Melbourne.—Account Books.

689. Wilcox, J., Fitzroy.—Spiral Turning.

SECOND-CLASS CERTIFICATE.

632. Schuhkrafft and Howell, Messrs.—Lithographs.

453. Davies, ——.—Photographs : Portraits.

621. Robinson, T. W., Fitzroy.—Photographs : Buildings.

656. Taylor, John, Melbourne.—Imitations of Marble.

No. of Exhibit.

698. Wilson, Mrs. H., Richmond.—Fire-screen in Leather Work.

698. Wilson, Mrs. H., Richmond.—Ornamental Work.

614. Rees, Mrs., Carlton.—Ornamental Leather Work.

497. Goodhugh and Co., Messrs., Melbourne.—Printing.

573. Mason and Firth, Messrs., Melbourne.—Printing.

568. McLennan and Co., Messrs., Castlemaine.—Hosiery.

579. Milne, Wm., Melbourne —Boots and Shoes.

470. Espie, Messrs. G. and J., Melbourne.—Shirts.

488. Galvin, John, Melbourne.—Hats.

400. Benjamin, B., Melbourne.—Stays.

487. Fulton, Anna Maria, Melbourne.—Stays.

596. Oxley, G. W., Back Creek.—Volunteer Uniform.

672. Vickers, Joseph, Collingwood.—Seine Nets.

530. Huenerheim, Mrs. H., Melbourne.—Needlework.

660. Terlecki, F., Melbourne.—Carved Frame and Wood Carving.

Arnold, C., Carlton.—Chessboard.

448. Crofts, Oxley, and Crofts, Messrs., Melbourne.—Soap.

629. Schielblach, C., Back Creek.—Soap of third quality.

395. Beal, W. T., Prahran.—Fancy Soap.

464. Downie and Murphy, Messrs., Melbourne.—Candles.

625. St. Paul Brothers, Melbourne —Confectionery.

491. Gaskell, Joseph, Melbourne.—Stuffed Birds.

527. Hooper, G., Back Creek.—Stuffed Birds.

510. Handasyde, McMillan, and Co., Messrs., Melbourne.—Box Bar Beehives.

549. Lindsay, A., Hotham.—Mahogany Box Bar Beehives.

451. Dakin, M, Melbourne.—Hexagonal depriving Beehive.

HONORABLE MENTION.

649. Strutt, W., Collingwood.—Portrait of the late Colonel Neil.

513. Hart, H. H., Melbourne.—Wood Ducks, painted by Dexter.

599. Paulson, A., Castlemaine.—Bush Flowers, in water colors.

No. of Exhibit.

696. WILLIAMS, M. J.—Photographs: Portraits.

671. VANHEENS, H., Kilmore.—Photographs: Views.

416. CAIRNES, E. M., Commissioner of Mines Office.—Pen and Ink Drawings.

518. HENTY, MRS. R., Richmond.—Pen and Ink Drawings.

460. DIKE, N. W., Melbourne.—Graining.

484. FREEMANTLE, MRS., Prahran.—Worsted Work.

477. FERGUSON AND URIE, MESSRS., North Melbourne.—Ornamental Glazing in Lead.

489. GANT, H. D., Geelong.—Ornamental Hair Work.

546. LEVITT, S. J., St. Kilda.—Leather Work Frame.

468. ELLEMOR, F., Melbourne.—Graining.

554. LYON, J. L., Maldon.—Design for Stained Glass.

595. BARNARD, Ovens Local Exhibition Committee.—Musical Diagram.

624. SAINT, A. G., Melbourne.—Writing on glass.

415. BURGOYNE, MRS., Richmond.—Leather Work.

458. DETMOLD, W., Melbourne.—Account Books.

580. MILLS, A., Geelong.—Bookbinding.

632. SCHUHKRAFFT AND HOWELL, MESSRS., Melbourne.—Paper Bags.

482. FORD, BROTHERS, Melbourne.—Calico Bags.

411. WALTER BROWN, Melbourne.—Calico Bags.

647. STEWART, MRS., Geelong.—Stays (Colonial made).

383. ALCOCK AND CO., MESSRS., Melbourne.—Turned work.

419. CAMPI, T. AND A., MESSRS., Melbourne.—Glass and Frame.

422. CARR AND SON, MESSRS., Melbourne.—Window Blinds.

581. MITCHENER AND RICHARDSON, MESSRS., Melbourne.—Window Blinds.

424. CHAMP, W., Pentridge.—Flower-stand.

463. DOUBLEDAY, J, Fitzroy.—Inkstands.

382. ALVES, J., Melbourne.—Fishing Tackle.

584. MOURANT, J. J., Collingwood.—Huon Pine Taps.

582. MONTGOMERY, R., Collingwood.—Cork Cutting.

617. RILEY, T., Melbourne.—Chess Table.

No. of Exhibit.

397. Beard, Jas., Richmond.—Inlaid Marble Paper Weights.

500. Greenwood, S., Richmond.—Chessboard carved in Cardboard.

512. Hayes and Co., Messrs., Saltwater River.—Soap.

464. Downie and Murphy, Melbourne.—Soap.

448. Crofts, Oxley, and Crofts, Messrs., Melbourne. — Tallow Candles.

512. Hayes and Co., Messrs., Saltwater River.—Locomotive and other Grease.

677. Ward, T., Melbourne.—Soap Powder.

702. Wood, W. J., Toorak.—Blacking.

93. Wilson, Messrs., Fitzroy.—Blacking.

473. Ewing, Thomas, Fitzroy.—Yeast Powder.

486. Fulker, G., Carlton.—Stuffed Birds.

701. Wood, Wm., Collingwood.—Stuffed Birds.

639. Slade, G. and Co., Eagle Foundry, Collingwood.—Four economic Cooking Ranges.

SUPPLEMENTARY AWARDS.

FIRST-CLASS CERTIFICATE.

No. of Exhibit.

650. Summers, C., Melbourne.—Design for the Seal of the Commission.

454. De Castella and Anderson, Messrs., Melbourne.—Bitumenized Pipes.

574. Martin, C. R., Melbourne.—Gold and Silver Embroidery.

Thwaites and Son, Messrs., Melbourne.—Gothic Case for Exhibiting Gold, &c.

412. Bruce, Mr. J. A. V., Sunbury.—Gold presentation Inkstand with Pedestal.

330. White, W. and G., Messrs., Williamstown.—Models of Boats and Ships.

16. Fordham, F., Emerald Hill.—Smoked Bacon.

685. Whitehead, Isaac, Melbourne.—Wall Decorations, Picture Frames, and Decorative Furniture.

336. Witton, H. J., Collingwood.—Clarionet Reeds.

Knight, J. G., St. Kilda.—For the Design of the Gold Pyramid.

665. Tocknell, W., Melbourne. — Ornamental and Writing Engraving.

661. Thomas and Murphy, Messrs., Melbourne. — Jockey Boots.

433. Clubb, T. J. and E., Messrs., Melbourne.—Surgical appliances.

491. Gaskell, J., Melbourne.—Emu Oil.

327. Wenzel and Enes, Messrs., Melbourne.—Pocket Barometer.

275. Leicester, C., Melbourne.—For Minerals and Machines exhibited by him.

638. Skeates and Swinbourne, Melbourne.—Machine-made Mouldings and Doors.

222. Appleton, H., Melbourne.—Introduction of Stone-breaking Machine.

Livingston, D., Carlton. — Design for Exhibition Gold Case.

482. Ford Brothers, Messrs., Melbourne.—Camels' Shoes.

No. of Exhibit.

482. FORD BROTHERS, MESSRS., Melbourne.—Patent Hats, Caps, and Machine Sewing.

517. HENSON, H. E., Melbourne.—Guns, Bullet Moulds, Caps, and Bird Skins.

307. RUSSELL, W. M., Collingwood.—Model of Record Buoy.

212. WILKINSON, R. W., Back Creek.—Geological Specimens and Precious Stones.

700. WIPER, J., Melbourne.—Specimens of Cut, Bent, and Blown Glass.

547. LEVY BROTHERS, Melbourne.—Gold mounted Myall Wood Pipes.

493. GIBBONS, W. S., Melbourne.—Products from Coal Tar, Dyes, &c.; Illustrations of Food Pure and Adulterated; Processes for Clarifying Liquids; Magnified Microscopic Photographs; Microscopic Preparations.

288. MILLER, F. McD., Fitzroy.—Cartridges and compressed Bullets.

191. REID, D., Barnawatha.—Collection of Jewellery and Precious Stones, from Reid's Creek, Ovens.

BLAND, R. H., Melbourne.—Quartz-crushing Machinery.

242. DEVEREUX, J., Fitzroy.—Stringed Musical Instruments.

286. MATTHIAS, J. R., Melbourne.—Blackwood Bass Drum, with Patent Braces, Colonial made.

405. BOUCHET AND JOURDAN, MESSRS., Melbourne.—Wigs and Ornamental Hair.

562. McKAY, ——., Melbourne.—Fountain.

452. DANKS AND COS., MESSRS., Melbourne.—Wrought Iron Gas Fittings.

408. BRIGHT AND HITCHCOCK, MESSRS., Geelong.—Millinery and Mantles.

461. DILLON AND BURROWS, MESSRS., Melbourne.—Lozenges.

169. LAIDLAW AND PARTY, Maxwell's Reef.—Specimens of Gold in Quartz.

246. ELDER, HENRY, Bourke-street.—Clocks.

592. O'BRIEN, J., Hotham.—Penmanship.

471. EVANS AND SOMERTON, MESSRS., Maryborough.—The *Maryborough Advertiser*, printed on Satin and bound in Morocco.

387. ARESTI, J., Fitzroy.—New Process of preparing Painted or Washed Drawings on Stone.

322. THOMSON, R. AND W., MESSRS., Melbourne.—Mercurial Filters.

194. ROBERTSON, J. S., Inglewood.—For the collection of Mineral Specimens exhibited by him, and for his valuable assistance in promoting the object of the Exhibition.

No. of Exhibit.

213. WRIGHT, G. E., Inglewood.—For a collection of Specimens from Columbian Reef, Inglewood.

323. THORNE, J., Fitzroy.—Silver Strings for Violins, &c.

565. MCKENZIE, ——, Punt-road.—Rustic Seats for Gardens, &c.

540. LADE AND SANDERS, MESSRS, Melbourne.—Buggy Harness, with chased German Silver Mountings.

403. BISHOP, A., Melbourne.—Sign and Ornamental Writing.

RILEY, T., Melbourne.—For the execution of Mr. Knight's Design of the Pyramid of Gold.

MUELLER, DR., Botanical Gardens.—For services rendered in collecting Specimens of the Timber Trees of Victoria.

301. RANDLE, WILLIAM (Railway Contractor), Melbourne.—Working Model of Locomotive Engine and Tender.

556. MCCAPE, ——, Chiltern.—Powder Proof Lock.

225. BLAZEY, W. R., Richmond.—First Piano of Colonial Wood made in the Colony.

540. LADE AND SANDERS, Melbourne.—Side Saddle.

618. ROBERTSON, J., Melbourne.—For Dressed and Dyed Feathers of Australian Birds.

295. PERRY, J., Russell-street, Melbourne.—Steam-bent Felloes, Spokes, &c., of Colonial Wood.

JACKSON, ——, Ballaarat.—Steam-bent Timber.

GOERNEMANN, ——, La Trobe-street.—Steam-bent Timber.

333. WILLIAMS, ——, Railway Works, Spencer-street.—Machine-wrought Wood Work.

529. HOWARD AND BOOKEY, MESSRS.—For a collection of Birds, Reptiles, &c., from Beechworth.

117. WATSON, A. R., Ballaarat.—Specimens of Bullarook Timber, from Ballaarat District.

GEOLOGICAL DEPARTMENT.—For Lithographed Maps.

MORTON, W. L.—For the pure, excellent sample of Resin from the Sandarac Pyramidal Pine from the Murray.

SECOND-CLASS CERTIFICATE.

472. EVE, J. S., Melbourne.—Wigs and Ornamental Hair.

255. GIBBONS, W. S., Melbourne.—Microscopic Stage.

540. LADE AND SANDERS, MESSRS., Melbourne.—Bridles.

HONORABLE MENTION.

No. of Exhibit.

551. Bell, John.—Banner of the Loyal Industry Lodge, Man. Unity I.O.O.F., Richmond.
678. Warwick, H., Carlton.—Cork and Instrumental Boots.
238. Clifford, G. P., Melbourne.—Boat Lowering Apparatus.
320. Thompson, J. J., Melbourne.—Electro-Magnet.
466. Eaton, Miss.—Watercolor Drawing of Native Flowers.
359. Gibbons, W. S., Melbourne.—Series illustrating Analysis and Composition of Guano; Australian Guano, with Analyses.
425. Chatfield, Major C., Melbourne.—Austral Earth Soap.
560. McDonald, ——, Melbourne.—Photograph of Albion Hotel.
306. Robinson, J. C. (Porter, Victorian Railways).—Collection of Models of Ships.
93. Wilson and Co., Messrs., Fitzroy.—Vinegar.
252. Fletcher, ——, Kew.—Improved Milk Pails.

Hart, H., Collins-street, Melbourne.—For Native War Implements, and Fur Rugs of Native Animals.

ADDENDA TO CATALOGUE.

Rickard, David, Esq., Albert River, South Gipps Land.—Arrowroot grown in Gipps Land.

Cogdon, J., Warden, Ballaarat.—Samples of Wash Dirt, Quartz, Auriferous Cement, a decayed Tree, and Red Gum, collected in the neighborhood of Ballaarat.

Calder, John.—Oil Painting, "View of the Australian Pyrenees."

Davidson, R., District Mining Surveyor, Ballaarat.—Geological Plan of Ballaarat Gold Fields.

Red Jacket Mining Company, Ballaarat.—Sample of Wash Dirt.

By Authority: John Ferres, Government Printer, Melbourne.

VICTORIAN EXHIBITION, 1861.

REPORT ON CLASS III.

Indigenous Vegetable Substances.

JURORS.

DR. COATES, CHAIRMAN.

J. W. OSBORNE, ESQ. | EDMUND ASHLEY, ESQ.

By Authority:

JOHN FERRES, GOVERNMENT PRINTER, MELBOURNE.

1862.

JURORS' REPORT.

THE vegetable products indigenous to the Colony of Victoria are, as might be expected in a climate so favorable, both various and exceedingly interesting. They comprise a great number of forest trees, many of them of magnificent proportions, and valuable for their timber, their barks, their secretions of resins and gum resins, and for the abundant essential oils obtained by distillation from their leaves. In these resources alone, there is presented a vast field where industry and science may be peacefully associated, and reap the rich reward which is due to exertion and intelligence.

The forest trees may be stated to consist of about one hundred and twenty different species, of which there were upwards of ninety represented in the recent Exhibition. Through the unremitting care and vigilant supervision of Dr. Ferdinand Mueller, the whole have been identified with strict botanical accuracy as the trees whose names they bear, notwithstanding the slight deviations from normal appearance which some of them exhibit, arising from soil and situation, and altered climatic conditions. In addition to one species of Acacia, commonly known as the Blackwood, the Eucalypti embrace the most important of the native woods that are used for economical purposes, in the Blue Gum, the Red and White Gums, the Ironbark, the Box, and the Stringybark, of all which many excellent specimens were presented for inspection. These are among the largest forest trees of South-eastern Australia; and in favorable situations many of them attain enormous height and girth. The Blue Gum often reaches to nearly three hundred feet, and to one hundred and twenty feet without a lateral branch, exhibiting a noble object in

some of the landscapes of Victoria, and the material which industrial skill may convert to innumerable useful appliances.

It is to be regretted that the use of local or conventional names, too frequently dependant on some minor peculiarity, or fancied resemblance to the trees of the Old World, has occasioned a great deal of confusion respecting the particular species of tree to which these names have been applied. The Box of one district, for instance, has another designation in another locality; and the same fact may be stated of the Peppermint, the Messmate, the Mountain Ash, the Myrtle, and many others. This irregular and indefinite language, without any reference to characters, naturally leads to misapprehension of our timber trees, their qualities and proper applications; and has the further effect of rendering inquiry into their comparative fitness for various economical uses attended with considerable difficulty and uncertainty.* Even among those who might have been supposed to be familiar with the characters of these timbers, and whose duties and occupations would have necessitated the study of their peculiarities of structure, the same confusion and uncertainty prevail. It is well known that the Blue Gum is often mentioned in specifications where the Stringybark is used by the contractor, and passed by the architect or civil engineer. Such is the difficulty they have in determining between these woods, that it is usual in many contracts to substitute the term "or best hardwood," where the Blue Gum (considered one of the most valuable of our timbers) ought properly to be supplied. The question has been brought to issue in the Supreme Court of the Colony, and half-a-dozen practical men have been found on either side to maintain with equal vehemence and pertinacity the colours of their respective shields.

The proper season for cutting the trees for timber has scarcely received that amount of attention which it deserves, being often made secondary to the convenience of the woodman or the means of favorable transport; and yet the influence which it must exert on the physical qualities of the woods might probably explain some of the discrepancies regarding their properties, uses and

* The Jurors have the satisfaction to announce that Dr. Ferdinand Mueller, F.R.S., the zealous and accomplished Government Botanist of Victoria, is at present engaged in the preparation of a work on the Eucalypti of the Australian Continent, accompanied by numerous illustrative engravings, which will afford every information relative to this important tribe of our forest trees.

durability which are current among intelligent workmen. Similar indifference and neglect have also been manifested with regard to the seasoning of the timber after it has been fallen; and the complaints that have been made of the shrinking of work performed in haste and with ill-conditioned materials, ought righteously to be placed at the door of those who are guilty of these gross anomalies. In the past, when wages were exorbitantly high, and other occupations gave an almost extravagant remuneration, it is no wonder that these employments were considered of minor importance, and afforded but little hope for any beneficial investment of capital and labor. The gold-fields were the scene of all-absorbing interest, and ordinary avocations were neglected for the brighter visions on Ballaarat and Bendigo.

Since that period we have entered on a new era in colonial history. The necessaries of life have become greatly reduced in cost, and labor is abundant at moderate remuneration. Trunk lines of railway communication, combined with improved and extended roads are rapidly opening up the interior, and rendering the valuable and magnificent timber trees of hitherto inaccessible districts available to the growing exigencies and requirements of the country. The propriety of cutting the trees at those seasons of the year when active vegetation has ceased, and the urgency of attention to the further preparation of the timber, will lead to the employment of labor and skill in these necessary operations, and give a character to their qualities and capabilities that have scarcely been sufficiently appreciated.

For many purposes their density and hardness, and the greater difficulty of their workmanship, form objections to their use. In consequence there is a considerable importation of Baltic and other soft woods from Europe and America into the colony, not only in the form of beams, planks and lumber, but as ready made doors and sashes for building purposes. Victoria produces no pine of any size; the only species having any alliance thereto, being comparatively small trees of the genus *Callitris*, found in the neighbourhood of the River Murray. Beside these importations of Baltic and other timbers from Europe and America, there is a large amount sent annually from Tasmania and New South Wales. From the former of these colonies we receive immense quantities of Blue Gum for engineering and building uses, and posts, rails and palings of the Stringybark for fencing. The

Huon Pine, Blackwood, and the Beech (called the Myrtle) are also sent to us for use as furniture woods. New South Wales supplies us with Cedar for similar purposes, with Ironbark for the spokes of wheel carriages, and with Apple-tree (*Angophora*) for the naves of wheels.

The Custom House returns of the value of the timber imported into Victoria, for the several years of 1858, 1859, and 1860, are as follow :—

	1858.	1859.	1860.
Foreign	344,045	233,862	161,142
United Kingdom...	191,891	92,353	61,214
COLONIAL.			
New South Wales	34,567	14,261	23,295
New Zealand	4,938	2,380	120
South Australia	1,093	1,778	281
Tasmania	150,773	101,762	78,915
Other Colonies	6,020	19,935	20,209
£	733,327	466,331	345,176

Various reasons have been operating to produce the diminished importations of the last two years. The general and progressive improvement in the character of our buildings by the substitution of brick and stone for the temporary and hazardous structures of wood has had its influence; and the circumstances which have been already alluded to in opening up our own resources by improved facilities of communication, are too decided to be overlooked. There is exhibited a large expenditure of funds in those identical materials of which many are spread around us on our own shores in the most extraordinary profusion, and of equal excellence to those we have been accustomed to procure from the neighbouring colonies. But these importations will in all probability continue to decrease, as our own products are year by year rendered more easily available. The foreign timber of Europe and America is of course indispensable to our present necessities, and its consequent introduction unavoidable; but there are millions of acres in the mountain ranges of Victoria where these varieties of Pine may be planted, and with every prospect of success in the supply of future wants.

It is a general character of the Australian hard woods when cut into beams, planks and quartering, and exposed for a short time to the action of the atmosphere, that they become much firmer in texture, and at the same time more difficult to work, requiring the frequent sharpening of the carpenter's tools. This quality is probably owing to increased density of the woody structure, and especially to the copious distribution and solidification of an astringent gum resin in its substance. Under the microscope the cells containing these deposits are so peculiar, that their further notice and delineation are desirable, since they may perhaps serve to assist in the determination of the particular species of tree to which the timber belongs. In comparing the Ironbark of Victoria with one of those of New South Wales (considered to be botanically identical, *Eu. sideroxylon*), the latter exhibits a much smaller number of cells dispersed through the substance of the woody fibre, they are commonly arranged in single file, rarely in a double series, and present a deep ruby-red color. The Victorian Ironbark has a greater abundance of these cells, more frequently they exhibit a double arrangement, and the general color is rather orange than ruby, though individual cells may be seen of the latter hue. The vascular tissues in both woods are literally flooded with extravasated gum, as if the pitted ducts had suffered rupture or displacement by the pressure. It is not a little singular in connection with these observations that our wheelwrights practically distinguish between these woods, preferring the Sydney Ironbark to that of indigenous growth, and hence large quantities are annually imported for the uses of these artisans. How far the differences alluded to may depend on soil or climate, on the northern or southern exposure of the trees in their growth, or on other causes, are subjects that require investigation, and promise to be of some practical significance.

The abundance of these cells in the *Eu. leucoxylon*, or Box, their remarkable size and pale lemon color by transmitted light, are very characteristic of this timber. The same appearances of extravasation in the vascular tissues also occur notwithstanding the commonly received opinion that this is not a resinous wood. The nature of its gum resin is probably different, containing less tannin, and a large amount of hydro-carbon, from the brilliancy and heat which accompany its combustion.

The structure of *Eu. rostrata* or Red Gum presents these cells

of a beautiful red color, commonly in a double series, and accompanied by even more abundant infiltration than either of the Ironbarks, since it appears diffused in the woody fibre. There is scarcely a more splendid object for the microscope than a well illuminated section of these cells in the Red Gum. The three varieties of the Eucalyptus which have been mentioned are generally regarded as the most durable of our timbers; and it is a question of considerable interest how far this quality may be due to the presence of these gum-resinous deposits.

The durability of timber, when used in the construction of piers, wharves and jetties, involves an interesting and important inquiry, on account of the general costliness of these structures, and the rapidity with which they are apt to succumb to the attacks of those marine animals, the Teredo and the diminutive Chelura. These erections in Hobson's Bay alone have cost the enormous sum of One hundred and eighty thousand pounds, and at the present rate of their decay, it will be necessary to renew them in the course of fifteen or twenty years. When the piles become bored by the Teredo, or eroded by the action of the Chelura, until their diameter is reduced to one-half, the whole superstructure is endangered, and immediate repair or renewal is urgent. Constant examination and repairs are thus needful, and it must be obvious that in deep water these operations are attended with the utmost difficulty. It is not a little curious that hitherto no kind of wood has been able to resist these agencies but the Swan River Mahogany, which is a species of Eucalyptus restricted to Western Australia. Examination of its structural peculiarities reveals the presence of cells of extraordinary size and number, far surpassing those which have been previously noticed in other woods. Next to these in size and number are those of the Red Gum, and in the estimation of Captain Ferguson, the Chief Harbor Master of Williamstown, this timber resists for a long time the destructive agency of the Teredo, and is inferior only to the Swan River Mahogany. By the kindness of this gentleman, the following information has been furnished from his department, relative to this subject:—

RETURN SHOWING THE APPROXIMATE INJURY DONE BY THE *TEREDO NAVALIS*, AND OTHER SEA WORMS, TO SUBMERGED TIMBERS WITHIN THE WATERS OF VICTORIA.

No.	Locality.	Date when the Pile was driven.	Description of Timber.	Depth of Water from the bottom surface to high-water mark.	Diameter of Pile when driven.	Present thickness of Pile at low-water line.	Destruction of Pile by Worms.	Strength of Tide where Pile was driven.	Fresh or Sea Water.
1	Bottom of River Yarra ...	...	Red Gum[1] ...	17 feet	...	...	... ...	...	Salt
2	Diamond Wharf, Melbourne ...	1846	Ditto[2] ...	5 „	11 inches	11 inches	Nil	...	Fresh
3	Queen's Wharf, Melbourne ...	1842	Stringybark ...	10 „	12 „	12 „	Nil	...	„
4	Ann-street Pier, Williamstown	1858	Ditto ...	6 „	15 „	15 „	Nil	...	Sea
5	Sandridge Old Pier	1852	Ditto ...	3 „	7 „	5 „	2 inches in 8 years	...	„
6	Portland Old Jetty	1846	Ditto ...	5 „	11 „	8 „	3 „ in 14 „	1 knot	„
7	Ditto	...	Ditto ...	10 „	12 „	10 „	2 „ in 14 „		
8	Ditto	...	Ditto ...	12 „	7 „	5 „	2 „ in 14 „		
9	Warrnambool Old Jetty ...	1849	Ditto ...	11 „	9 „	...	Eaten right through	3 knots	
10	Old Pier, Williamstown ...	1852	Blue Gum ...	4 „	11 „	9 „	2 inches in 8 years		
11	Ditto	1855	Ditto ...	6 „	11 „	8 „	3 „ in 5 „		
12	Sandridge Old Pier	1854	Ditto ...	10 „	15 „	13 „	2 „ in 6 „		
13	Railway Pier	...	Ditto ...	12 „	17 „	15 „	2 „ in 6 „		
14	Geelong, Yarra Wharf ...	1847	Ditto ...	5 „	10 „	9 „	1 „ in 13 „		
15	Mud Flat, entrance to Yarra ...	1849	White Gum[3] ...	8 „	14 „	11 „	3 „ in 11 „		

[1] Cut from a red gum tree raised from the bottom of the Yarra a few days ago, near Spencer-street Dock, where it had evidently lain many years. The worms were alive when it was brought to the surface. Considering the presence of these worms in a fresh-water river somewhat unusual, I had the water at the spot where the tree was taken from pumped up at low-water, from different depths, and ascertained that it was fresh at and from eight feet below the surface; at twelve feet brackish; and at sixteen feet quite salt. The tree was found laying in seventeen feet of water.

[2] Cut from a pile drawn out of the north side of the River Yarra, about 150 feet above Cole's Dock.

[3] Drawn out of the north bank of the Yarra, at its junction with Hobson's Bay. It had been driven ten feet under ground. All the timber below the surface is sound. The latter remark applies to all piles I have seen drawn out of the ground.

RETURN OF INJURY DONE BY THE TEREDO NAVALIS, ETC.—*continued.*

No.	Locality.	Data when the Pile was driven.	Description of Timber.	Depth of Water from the bottom surface to high-water mark.	Diameter of Pile when driven.	Present thickness of Pile at low-water line.	Destruction of Pile by Worms.	Strength of Tide where Pile was driven.	Fresh or Sea Water.
16	Sandridge Old Pier	1853	White Gum ...	3 feet	13 inches	11 inches	2 inches in 7 years		
17	Sandridge Railway Pier ...	1854	Ditto[4] ...	12 „	14 „	12 „	2 „ in 6 „		
18	Steam-boat Wharf, Geelong ...	1849	Ditto ...	9 inches	10 „	8 „	2 „ in 11 „		
19	Customs Wharf, Geelong ...	1852	Ditto ...	7 ft. 6 in.	8 „	6 „	2 „ in 8 „		
20	Old Jetty, Warrnambool ...	1849	Blackwood ...	11 feet	9 „	...	Eaten right through	3 knots	
21	Ditto	...	... ...	11 „	9 „	...	Ditto	Ditto	
22	New Steam-boat Jetty, Geelong	1843	Sheoak[5] ...	5 „	7 „	6 „	1 inch in 17 years	½ knot	
23	*Black Squall*, off Williamstown	1854	Teak[6] ...	7 „	Specimen	4 in. square	Riddled		
24	Railway Pier	1854	Swan River Mahogany[7]	12 „	8 inches	...	Untouched ...		
25	Swan River Wharf, Western Australia	1832	Ditto[8] ...	...	...	...	Ditto		

[4] A portion of the Sandridge Railway Pier was built upon old vessels: they are all more or less eaten by the worms. The oak stern-post of one is reduced from its original thickness of thirteen inches to five and a half inches. The various piles composing the outer end of this pier, which have been down since 1858, show scarcely any symptoms of the worms. This remark applies also to the Railway Pier and Breakwater at Williamstown.

[5] Taken from a boat jetty at Geelong. I had a piece of sheoak pile, which formed a part of Liardet's Jetty, in Hobson's Bay, driven in 1840, in eight feet of water. When drawn, in 1854, it was but slightly touched by the worms.

[6] Taken out of the top side of the sunken hulk *Black Squall*, which vessel has lain sunk off Williamstown since 1856. The whole hull, when seen at low water is completely riddled by the worms.

[7] This piece of Swan River mahogany was cut from a fender pile at the Comet Wharf; it had been bolted to a blue gum pile just below the surface at low water.

[8] This is a piece of Swan River mahogany, or "Jarrah," recently received from the Harbor Master, Swan River. It was cut from a pile which had formed part of a wharf there since 1832. It shows no signs of worms, yet these animals do exist there as well as here. In a work on Western Australia (*Western Australia*, by Nathaniel Ogle, F.R.G.S.) I recently read, it is stated that a jetty at Swan River, which had been built in the early days of the Colony, of oak procured from a wreck, was completely destroyed by the teredo, whereas the mahogany similarly exposed had not been touched by them.

"From the foregoing statement it would appear that in Hobson's Bay, when there are good piles driven, there is a steady destruction hy worms of at least one quarter of an inch per annum of each pile now driven.

"At Geelong and the other ports the action of the worms does not seem so destrnctive. This may, in the case of Geelong, be attribnted to the water round the wharves being more impregnated with mnd, a circumstance which I have ohserved decreases the activity of the worms. In illustration of this, I may mention that it is a frequent practice with masters of vessels when they suspect their vessels have been wormed, to run them aground on a mnddy bottom, with the object, as they say, of killing the worms.

"These examinations principally extend from high water to low water line; bnt from other observations made, I have observed that when any piles have been drawn, the ravages of the Teredo were even greater below low water level than above it."

These researches of Captain Ferguson are highly creditable to the industry and zeal of that gentleman in the public service; and point out the propriety of instituting frequent examinations of this nature, and at the same time of giving particular attention to the timbers employed. It cannot be stated with certainty that those denominated Blue Gum, and Stringybark, and White Gum in the table above, are *all* of them named with strict correctness; but at the present time, in any works or repairs that become necessary, the utmost attention is paid to this and other circumstances, in order to ensure the collection of accurate data for future comparison.

It has been thought expedient, under the names of the most important trees, to present a short account of some of the chief practical uses for which the Colonial timbers are commonly employed; and thus to point out to newly-arrived immigrants and those who have made but little acquaintance with their capabilities, the purposes to which they may be advantageously applied. For this information many persons have been consulted, whose knowledge and experience on these subjects entitle their opinions to respect and consideration.

In reference to the elasticity and strength of our timbers, it must be confessed that hitherto no experiments of a reliable or satisfactory character have been made; and the opportunities at the command of the Jurors have not been such as to induce them to enter on this laborious and most desirable investigation. In the neighboring colonies of New South Wales and Tasmania, the

subject has received a partial notice as regards some of the woods, but on too limited a scale of operations for the results to be acknowledged as established data. There is consequently no definite information to be given on these matters, though it is hoped the Government may be induced to consider the importance and necessity of such an investigation, and at no distant period to appoint a Commission for the purpose. The desirability of this knowledge is obvious, and yet, as far as we have been able to ascertain, our architects and civil engineers have made no efforts to supply the deficiency, nor have they taken the initiative to procure its accomplishment.

The recent Exhibition afforded numerous illustrations of the usefulness of our indigenous materials for various industrial appliances, for the purposes of furniture, and for smaller articles of turnery and ornamental workmanship. The admirable adaptations of Blackwood to light and heavy framing of every description, to the naves and rims of wheels, and to innumerable specimens of cabinet work of the highest excellence, were seen to great advantage, and obtained universal commendation. Numerous elegant pieces of ornamental work also displayed the peculiar beauty and figure, the closeness of grain, and in some cases revealed the fragrant odors of the smaller woods, and showed how well they are deserving of more extensive notice than they have hitherto received. Many of these lesser timber trees are comparatively unknown; and the difficulties already adverted to, in the want of proper roads and available means of transport, have thus prevented the various treasures of our forests becoming readily accessible to the requirements of our artisans.

The formation of an industrial museum, where specimens of all the Colonial timbers might be seen, and information obtained of their characters, qualities, and distribution, seems only to require suggestion for its practical value to be thoroughly appreciated. It would serve as a permanent exhibition, and a school of useful instruction; and might be appropriately supplemented by the addition of articles of manufacture to illustrate the applications of our Timbers to the various uses for which they are specially adapted. The Exhibition which has just closed would thus leave a lasting record of its utility, as the parent of an institution that might every year become more interesting and more valuable, and would indicate with the authority of ocular demonstration

the resources that are contained in our Indigenous Vegetable Products.*

The specific gravities of the woods have been ascertained with every care and attention to precision. Portions of the various specimens exhibited were taken, and submitted during the several summer months to the gradual process of drying, in a current of atmospheric air, before the final operation of the balance. The sections were thin, and about three by two inches in length and breadth, thus exposing but a small surface of the ends of the woods to absorption of water, and the results may therefore be regarded as possessing presumptive claims to determinate accuracy.

Acacia melanoxylon, or Blackwood.—The most valuable of all our Colonial timber trees undoubtedly is the Acacia melanoxylon, or Blackwood, sometimes also called Lightwood. It is extensively employed in the construction of railway and private carriages, as it is well adapted both for light and heavy framing purposes; and in this respect contrasts most favorably with the best of the English woods. The naves and spokes of light wheels are often made of it; and from its quality of bending with facility, it is highly prized for gig and buggy shafts, and the rims of light carriage wheels. The circular framework of a large drum in the Exhibition has been formed out of one piece of Blackwood. Excellent gun-stocks are made of it; the cooper uses it largely for the staves of casks; the turner in wood for a great variety of ornamental purposes; and occasionally it is sawn into shingles for the roofs of dwelling-houses.

In the beauty of its duramen, Blackwood possesses many resemblances to the best walnut, and is considered even superior to that wood, being harder and more durable; it is a favorite wood with cabinetmakers for furniture of every description, and receives a very high and beautiful polish.

Eucalyptus rostrata, or Red Gum.—The Eucalyptus rostrata, or Red Gum, is a very hard compact wood, of a bright red color, and abundantly found in almost every part of the Colony. When properly seasoned, it possesses great strength and durability, and appears well adapted for many purposes in ship-building, for the

* Since the above paragraph was written, Dr. Mueller has informed the Jurors that a large collection of the native Timbers has been prepared for this purpose, but that the present Botanical Museum is too small in extent to admit of their being satisfactorily exhibited.

heavy deck framing, the beams and knees of vessels, and for planking above the light-water mark. It is much used for joists in ordinary building; as planks of large dimensions for culverts, and for bridges and wharves; and by wheelwrights for the felloes of heavy wheels. Railway sleepers are also made of Red Gum. The curly nature of the grain renders it of comparatively little use in the form of small scantlings, where strength is required.

For furniture purposes it is deserving of notice, being tough, handsome, and durable, and takes an excellent polish.

Eucalyptus globulus, or Blue Gum.—The Eucalyptus globulus, or Blue Gum (so called from the peculiar hue of its foliage), is a hard light-colored timber of great durability, and extensively used in the erection of buildings, for beams, joists, and rafters; for piers and bridges; and for railway sleepers. It seems also well adapted for numerous purposes in ship-building, from the great lengths in which it can always be procured, especially to outside planking as far as the light-water mark, and to other uses. It has been employed for the masts of vessels.

Eucalyptus goniocalyx and others, or the White Gum.—Several species of Eucalyptus yield the timber which passes current under the name of White Gum, of which the chief appears to be the Eu. goniocalyx. All present the same general characters of a hard straight-grained timber, and are similarly employed in the erection of buildings, for joists, beams, and rafters, and occasionally for heavy framing. It is used by the cooper for the staves of casks.

Eucalyptus sideroxylon, or Ironbark.—The Eucalyptus sideroxylon, or Ironbark, is one of the hardest and heaviest of our native woods, and has a peculiarly thick and rugged bark, with deep longitudinal fissures, which is strikingly characteristic. It possesses great strength and tenacity, and has a close and straight grain, on which account it is highly useful to the coachmaker and wheelwright for the poles and shafts of carriages, and the spokes of wheels. Its greasy nature also renders this wood very serviceable to the millwright for the cogs of heavy wheels. It is also valuable for many purposes in ship-building, and constitutes one of the most imperishable of our timbers.

Eucalyptus fabrorum, or Stringybark.—The Eucalyptus fabrorum, or Stringybark, obtains its vernacular name from this characteristic of its bark. It is a hard straight-grained timber, and in general use for a great variety of building purposes. It splits

with facility, forming posts, rails, and palings for fencing, and shingles for roofing.

Eucalyptus leucoxylon, or Box.—The Eucalyptus leucoxylon, or Box, is a valuable timber of a light color and a greasy nature, remarkable for the hardness and closeness of its grain, its great strength and tenacity, and its durability both in the water and when placed in the ground. It is largely used by coachmakers and wheelwrights for the naves of wheels and for heavy framing; and by millwrights for the cogs of their wheels. In ship-building it has numerous and important applications, and forms one of the best materials for trenails, and for working into large screws in this and other mechanical arts.

Eucalyptus dealbata, or Grey Box.—The Eucalyptus dealbata is another species also known as the Box, or the Grey Box, and is used for similar purposes to the preceding. After the removal of the bark it is most difficult, if not impossible, to distinguish between the species.

Eucalyptus fissilis, or Messmate.—The Eucalyptus fissilis, or Messmate, has many characters of the White Gum, is hard and straight-grained, and splits readily into posts, rails, palings, and shingles for fencing and building purposes. Wheelwrights use it for the shafts and framing of drays, for plough-beams, and many similar applications.

Eucalyptus Woolsii, or Woollybutt.—The Eucalyptus Woolsii, or Woollybutt, is a hard straight-grained timber, of a reddish color, used by the coachmakers and wheelwrights for the spokes of wheels, though considered inferior for these purposes to the Ironbark. It is also split into posts and rails for ordinary fencing.

Blackbutt and Bloodwood.—The Eucalyptus persicifolia, or Blackbutt, and the Eu. corymbosa, or Bloodwood, are less known to our artisans than their apparent qualities would seem to merit. They exhibit a clear grain, of a red color, and are well adapted for many useful purposes in the mechanical arts.

Eucalyptus inophloia, or Mountain Ash.—The Eucalyptus inophloia, or Mountain Ash, is so called from a fancied resemblance to the British timber of that name, and is employed by the coachmakers for bending into the form of shafts for light vehicles, for which it is well adapted. It has not hitherto received the attention it deserves, being ordinarily used for splitting into palings for fencing, and other inferior applications.

Angophora intermedia, or Apple Tree.—The Angophora intermedia, called the Apple Tree, grows within Victoria only, in the eastern part of Gipps Land, and forms a valuable timber for coach-makers and wheelwrights, who use it extensively for the naves of wheels.

Fagus Cunninghamii, or Beech.—The Fagus Cunninghamii, generally named the Tasmanian Myrtle, is essentially a Beech, and found in considerable quantities in some of the mountainous parts of Gipps Land. It is a reddish-colored wood, and much employed by cabinetmakers for various articles of furniture. Occasionally planks of it are obtained of a highly beautiful grain and figure, and when polished its highly ornamental character is sure to attract attention. It is also used for the cogs of wheels by millwrights.

Casuarina, or Sheoaks.—The Casuarina leptoclada, quadrivalvis, and cristata are species of the sheoak, well adapted for various furniture purposes, from the singular beauty of their grain. They are used for certain applications in ship-building, but are rarely found to exceed from two to three freet in diameter. It is an excellent wood for turnery uses, and the manufacture of small ornamental work. In some parts of the Colony this wood is known by the name of Beef-wood.

The Eucalyptus amygdalina is a hard close-grained timber, that has not hitherto been applied to any particular uses but ordinary fencing. Its leaves are valuable for the abundance of essential oil which they afford upon distillation, and which is referred to elsewhere.

The Acacia mollissima, or common Black Wattle, is abundant in every part of the Colony, and its timber is used for the staves of casks by coopers, while the bark is extensively employed for tanning purposes.

DIVISION II.

The timber trees of less dimensions than the preceding are more especially adapted for small furniture and turnery uses. Many of them exhibit a peculiar beauty of structure; some are highly fragrant, and retain their agreeable odor for a considerable period of time, which renders them additionally pleasant and acceptable in the form of ornamental articles to the boudoir and drawing-room.

Acacia homalophylla, or Myall.—The Acacia homalophylla, or scented Myall, is a very hard and heavy wood, of an agreeable odor, resembling that of violets. It has a dark and beautiful duramen, which makes it applicable to numerous purposes of the cabinetmaker and the wood turner, for the sheaves of blocks and an infinite variety of minor uses. It rarely exceeds a foot in diameter, but has been used for veneers.

The Callitris verrucosa, or Desert Sandarac Pine, is a tree of moderate size from the vicinity of the River Murray, seldom attaining to more than eighteen inches in diameter. It has a peculiar odor, from which it is sometimes called the Camphor Wood, and is said to be obnoxious to the attacks of insects. The dark beauty of its wood makes it useful for many articles of small cabinet furniture.

The Callitris pyramidalis, or Mountain Sandarac Pine, is similar to the preceding one, and available for identical use.

The Acacia salicina is a hard and heavy wood, having a dark duramen, which is applicable to the purposes of the cabinetmaker and the wood turner.

The Exocarpus cupressiformis, or Native Cherry, is a hard wood of a reddish color, and suitable, from the closeness of its structure, to similar uses as the preceding.

The Bedfordia salicina, or Dogwood, is a hard light-colored wood, which may be useful for inlaying and for turnery.

The Eurybia argophylla, or Muskwood, is a timber of a pleasant fragrance and a beautiful color, well adapted for turnery and cabinet work.

Myoporum insulare and Eleocarpus holopetalus each yield a beautiful light-colored wood, which have been used for inlaying.

Banksia serrata, integrifolia and Australis, or the Honeysuckle, yield a light timber of a beautiful grain, which is used for the stems and short knees of boats in the Government yard at Williamstown, and generally for cabinet furniture and various ornamental purposes.

The Panax dendroides is a soft white wood, somewhat resembling sycamore, which seems likely to be useful for many instruments of domestic use.

The Atherospermum moschatum, or Sassafras tree, affords a timber which is also useful to the cabinetmaker. It has a dark duramen, and frequently exhibits a pleasant figure, and has also the quality of taking a beautiful polish.

The Bursaria spinosa is a tree of small size, rarely exceeding a foot in diameter, but very hard and fine-grained, and adapted for turnery, carpenters' rules, and many other uses.

Callistemon salignus is a remarkably hard wood, which has been used; as also the Pittosporum bicolor, for wood engraving, by Mr. F. Grosse.

TIMBER AS FUEL.

Notwithstanding the numerous and laborious investigations that have been made in different parts of this Colony, no available coal-fields of any great extent have hitherto been discovered; and Victoria is thus dependant for its fuel upon importations of this material from New South Wales, and its own indigenous timber trees. From the high price of coal, the latter are necessarily in common and extensive use, and exhibit degrees of excellence for this purpose as various as for other industrial applications. On some of our railways at the present time, wood is used in considerable quantities, and at a much less cost per mile than ordinary coke. The average expense of wood per mile is 5½d., and that of coke is 7½d.; while three tons of wood are required to produce the effects of one ton of coke.

The Red Gum is extensively used as an article of fuel, from its general abundance; and though it burns with less rapidity and flame than some other woods, it maintains in its ashes an intense and durable heat. The charcoal is highly esteemed by the gold refiners and melters, and is also employed in other arts.

The Box is an excellent wood for domestic use, as it burns with great brilliancy, and emits a large amount of heat.

The Sheoaks are generally esteemed, and obtain a preference among bakers over every other wood for heating their ovens. The common Wattle is also used by the bakers, though considered inferior to the Sheoaks.

The White Gums and Stringybark are by no means equal to the timbers which have been mentioned, but they are nevertheless extensively employed. For railway purposes, the wood most used is composed of Sheoak and Red Gum, and the relative value of the latter to the White Gum is as 6d. to 8½d. per mile. A ton of good firewood costs about 8s.

POTASSA.

The ashes of these woods have as yet been converted to no profit in the manufacture of potash; neither does the subject appear to have received the attention requisite to furnish determinate quantitative results Several years ago two papers were published in the *Transactions of the Royal Society of Tasmania* on the amount of alkali in the trees of that colony, in which the statement was made that the yield is much greater than from the elm and maple, the best American woods. The per-centage from these is given as 3·9 parts of pure potassa from 1000 of wood; whereas the sheoak and white gum are said to produce 5 parts of potassa from 1000 parts of these woods. But the experiments on which these data are attempted to be founded will not bear the test of critical examination, and hence it is presumed that error has in some manner confused the calculations and distorted the results.

An impure alkali, obtained from the native woods, has been prepared and sold in Melbourne, but the article was very inferior, and the price merely nominal. To what circumstances this inferiority was owing, whether carelessness in the manufacture or the admixture of foreign substances, there is no information; neither is any knowledge to be procured of the per-centage of potash as the estimated product. The potassa which forms one of the exhibits is derived from the ashes of the tree fern.

DESTRUCTIVE DISTILLATION.

The destructive distillation of Eucalyptine woods yields the usual products of this operation in pyroligneous acid, tar, pyroxylic spirit or wood naphtha, and the residual charcoal. Accompanying these is also the formation of gaseous material in greater or less proportion, according to the elementary constituents of the substances that are acted on. The leaves and smaller branches of some species of Eucalyptus are especially rich in hydro-carbon compounds, and, as at Kyneton, are employed in producing gas for the ordinary purposes of lighting the streets. Of the amount and quality of the gas obtained from a given quantity of the leaves

B 2

and branchlets, the Jurors have no certain information; but it seems the process, with some modification, is still carried on, and suffices for all the necessities of the locality. Mr. Hugh Gray, of Ballaarat, has paid considerable attention to this subject of distillation, especially as regards the wood of the white gum. He "operated on 100 ounces of partially dried timber, and obtained as the first distillate the following products:—

Charcoal of superior quality	24
Pyroligneous acid	54
Tar	7
Gaseous matter	15
	100

"The second distillation of the 54 ounces of impure pyroligneous acid gave:—

Pyroxylic spirit	½
Pyroligneous acid	50
Tar	3½
	54

From these results of Mr. Gray, it is evident that a large yield of useful products may be obtained at a very moderate cost and trouble from this operation. The extraordinary abundance and cheapness of the raw materials can hardly fail to render the importation of similar distillates unremunerative, and give an impulse to another branch of industry in this colony.

Specific Gravities of the Indigenous Woods of Victoria.

The woods marked thus * have been steam-dried; all the others having been thoroughly air-dried.

The woods marked thus †, not exhibited by the Commissioners, were obtained from reliable sources.

Systematic Name.	Vernacular Name.	Specific Gravity.
†Eucalyptus leucoxylon ...	Box tree (Sydney)	1·129
†Eucalyptus leucoxylon ...	Box tree	1·125
Eucalyptus leucoxylon ...	Box tree	1·081
*Eucalyptus Woollsii ...	Woollybut	1·187
†Eucalyptus sideroxylon ...	Ironbark	1·106
†Eucalyptus sideroxylon ...	Ironbark (Sydney)	1·079
Eucalyptus sideroxylon ...	Ironbark	1·024
Eucalyptus acmenoides ...	Broad-leaved Box	1·066
Eucalyptus oleosa	Mallee tree	1·054

Specific Gravities of Indigenous Woods—*continued.*

Systematic Name.	Vernacular Name.	Specific Gravity.
Eucalyptus fabrorum ...	Stringybark	0·990
Eucalyptus fabrorum ...	Stringybark	0·941
*Eucalyptus fabrorum ...	Stringybark	0·809
Eucalyptus rostrata ...	Red Gum	0·923
Eucalyptus rostrata ...	Red Gum	0·858
Eucalyptus globulus ...	Blue Gum	0·889
†Eucalyptus globulus ...	Blue Gum	0·698
†Eucalyptus mahogany ...	Swan River Mahogany (Western Australia)	0·896
†Eucalyptus fissilis	Messmate	0·865
Eucalyptus persicifolia ...	Blackbut	0·803
Eucalyptus populifolia ...	... ...	0·854
Eucalyptus viminalis ...	Manna Gum	0·685
Eucalyptus inophloia ...	Mountain Ash	0·642
Acacia doratoxylon	Spearwood	1·215
Acacia homalophylla ...	Myall	1·124
Acacia dictyocarpa	... ...	1·021
Acacia spinescens	... ...	1·010
Acacia linearis	... ...	0·934
Acacia pycnantha	... ...	0·830
Acacia mollissima	Wattle...	0·773
†Acacia mollissima	Wattle...	0·727
Acacia melanoxylon... ...	Blackwood	0·777
†Acacia melanoxylon... ...	Blackwood	0·664
Acacia salicina	... ...	0·763
Acacia implexa	... ...	0·711
Banksia serrata	Heath Honeysuckle	0·803
Banksia integrifolia... ...	Coast Honeysuckle	0·799
Banksia Australis	Honeysuckle	0·610
Casuarina quadrivalvis ...	Sheoak...	1·037
Casuarina cristata	... ...	0·965
Casuarina cristata	... ...	0·935
Santalum acuminatum ...	Quandang	0·828
Santalum persicarium ...	Sandalwood	0·749
Pittosporum bicolor	... ...	0·874
Pittosporum acacioides ...	... ...	0·767
Melaleuca curvifolia... ...	Coast Tea-tree	0·993
Melaleuca squarrosa... ...	... ...	0·713
Exocarpus cupressiformis ...	Native Cherry	0·845
*Exocarpus cupressiformis ...	Native Cherry	0·756
Exocarpus pendula	... ...	0·813
Myoporum platycarpum ...	Sugar tree	0·840
*Myoporum insulare	... ...	0·819
Myoporum insulare	... ...	0·809
Acmene floribunda	Myrtle tree	0·935
Acmene floribunda	Myrtle tree	0·898
Fagus Cunninghami ...	Evergreen Beech	0·883
Panax Murrayi	Palm Panax	0·348
Heterodendron oleifolium ...	... ...	0·858
Viminaria denudata ...	... ...	0·623
Pomaderris apatela ...	... ...	0·772
Lomatia Fraserii	... ...	0·678

SPECIFIC GRAVITIES OF INDIGENOUS WOODS—*continued.*

Systematic Name.	Vernacular Name.	Specific Gravity.
Callistemon salignus ...	Stonewood	0·983
Prostanthera lasianthos ...	Mint tree	0·809
Pimelea microcephala ...	... ...	0·883
Eremophila longifolia ...	... ...	0·925
Callitris verrucosa	Desert Cypress Pine... ...	0·691
Hakea stricta	Water Hakea	0·818
Dodonaea attenuata... ...	... ...	1·022
Eurybia argophylla	Musk tree	0·642
*Myrsine variabilis	... ...	0·714
*Bedfordia salicina	Dogwood	0·896
Angophora lanceolata ...	... ...	0·893
Notelæa ligustrina	Spurious Olive	0·935

NOTE.—The specimens of woods, the specific gravities of which are here given, may be accepted as correctly named, as they were, wth a few exceptions, cut from those exhibited by the Commissioners. One or two samples from New South Wales and one from Western Australia are included for the sake of comparison.

The planks displayed in the Exhibition being unseasoned and green in a variable degree, it became necessary to bring the samples to be experimented upon to a state of dryness, uniform, and as near as possible, that which practical men consider best adapted for constructive works. To accomplish this within the very short time at command for the purpose, the specimens were carefully cut into flat tablets of about one fourth of an inch thick, and were then exposed on edge, with a free circulation of air in a perfectly dry and sheltered place, during four summer months. At the expiration of that time the woods were regarded as thoroughly *air dried*, and the determinations were made in the ordinary way, save that the weighing in water was accomplished with the utmost dispatch, to prevent as far as practicable, displacement by that fluid of the natural amount of air in the pores of the wood. The average time required for this weighing—the balance employed giving 0·01 grains—was about three minutes, and as the pieces of wood were cut so as to expose as little of the end of the grain as possible, the absorption which took place was not very considerable.

BARKS.

The Barks of most of the Acacia family, the Eucalypti, and the Sheoaks are remarkable for their powerful astringent qualities. It seems highly probable that, besides a large amount of tannin, they contain other proximate principles which are deserving of special examination. For the preparation of leather, the barks of the various Wattle trees (*Acacia*) are the most useful and the most commonly employed. The trees are stripped in September and the two or three following months, and the bark allowed to dry, when it is in a marketable condition. The Black Wattle (*A. mollissima*), which grows on the uplands, affords a larger proportion of tannin than the silver species (*A. dealbata*), whose habitat is on the banks of creeks and rivers; and from the abundant distribution of the former, an almost unlimited supply of bark is at

command. The leather produced by its use is characterised by a reddish-brown color, much deeper than that communicated by oak bark; but, on the other hand, it is considered to act more speedily, and with equally good results. The specimens prepared and submitted for inspection in the recent Exhibition were of the first quality, and elicited the highest approval of those who were competent to form an opinion on the subject.

The bark and seed-vessels of the Sheoaks are also very rich in tannin; but as Wattle Bark can be procured more readily, the supplies from other sources have been comparatively neglected.

As a tanning material, Wattle Bark first appears in the list of exports from this colony in the year 1843. By the courtesy of the Honorable the Commissioner of Customs, the following " Returns of the annual quantities and value " have been furnished :—

Year.	Quantity.	Value.
		£
1843	837 tons 15 cwt.	3,285
1844	3,049 „	9,182
1845	206 „	539
1846	562 „	1,455
1847	6 „ 10 cwt.	20
1848	Nil	...
1849	28 tons	90
1850	11 „ 5 cwt.	55
1851	64 „	970
1852	Nil	...
1853	Nil	...
1854	Nil	...
1855	14 tons	70
1856	5 „ 10 cwt. 442 bags and 38 packages	542
1857	216 tons 5 cwt.	2,043
1858	249 „	2,798
1859	212 „ 12 cwt.	1,310
1860	654 „ 13 „	6,382
Total ...	6,116 tons 10 cwt. 442 bags and 38 packages	£28,741

The present price of bark is £4 per ton.

An infusion of the inner bark of the Wattle is sometimes used as an internal remedy for chronic diarrhœa and dysentery, with good effect.

The barks of several species of Eucalyptus, but especially of the Stringybark, are removed in large sheets, and employed for roofing

purposes in the interior, giving a cool and effectual shelter from the sun and rain. The aborigines are very dexterous in the art of separating it from the trees, and flattening it for the uses mentioned. The fibre of the Stringybark does not possess any great tenacity or strength, but may be usefully employed in the manufacture of matting and mattresses, and probably as the material of a coarse paper.

The *Atherospermum moschatum, or Sassafras tree,* yields a bark of a highly fragrant odor, due to the presence of an essential oil, which forms one of the exhibits of this class. The infusion is used medicinally as a pleasant stomachic bitter and expectorant; and by some physicians is considered to have a peculiar effect on the heart, modifying excessive action, and reducing the violence and frequency of its pulsations. A mild infusion has been used as a substitute for common tea in certain districts of the colony, and is by no means an unpalatable beverage.

Ironbark.—The destructive distillation of the Ironbark, a particularly thick and rugged substance, studded with deposits of dark gum-resin, yields a large product of pyroxylic spirit, or vegetable naphtha. An exhibit of this kind was sent from Sandhurst, where the material is abundant. The presence of the tree *E. sideroxylon* is regarded as an indication of an auriferous region.

FIBROUS MATERIALS.

The fibrous substances of indigenous growth submitted for exhibition were comparatively few in number. The leaves of the *Corypha Australis,* the Fan Palm, or Cabbage-tree Palm of Eastern Gipps Land, affords the beautiful material of which the useful and durable cabbage-tree hats are made. The divisions of the leaves are still further subdivided by a simple operation into parts of equal breadth, and plaited in the same manner as straw. The tough and strong midrib of the leaflets is rejected for the uses mentioned, but is particularly serviceable in the manufacture of baskets and similar articles.

The well-known *Phormium tenax* of New Zealand is cultivated in the colony, and for purposes of cordage stands deservedly

at the head of this class of materials. A little attention might render it a valuable article for exportation or of local manufacture.

The *Cyperus vaginatus* is a species of sedge, which is distributed over not only a large portion of the colony, but almost over the whole Australian continent, and possesses a fibre of remarkable strength and tenacity. It has been used in the manufacture of fishermen's nets, and seems well adapted for the purpose. An exhibit of this kind, manufactured by aborigines, was presented for inspection.

The *Linum marginale*, or Native Flax, grows wild in many districts of Victoria, but its practical applications are at present too little known for any opinion to be given of its characters and value.

MANNA.

Two varieties of a substance called Manna, are among the natural products in the Exhibition. One kind is ordinarily found in the form of irregular little rounded masses, of an opaque white color, and having a pleasant sweetish taste. In the early months of summer it is most abundant, being secreted by the leaves and slender twigs of the *E. viminalis* from punctures or injuries done to these parts of the tree. The little masses often present an aperture at one end, showing the attachment of the small twig from which the manna has been secreted in a liquid form, at first transparent and of the consistence of thin honey, and then becoming solid, drops off in the condition that has been mentioned. It consists principally of a kind of grape sugar, and about five per cent. of the substance called *mannite.*

Another variety of manna is the secretion of the pupa of an insect of the Psylla family, and obtains the name of *Lerp* among the aborigines of the Northern districts of the Colony. At certain seasons of the year it is very abundant on the leaves of the *E. dumosa*, or Mallee Scrub, and these are occasionally whitened over with the profusion of this material so that the shrubby vegetation has the appearance of being *iced.* It is found in masses of aggregated cones, each covered with a filamentous material like wool, and has a color varying from an opaque white to a dull yellow. Beneath the little dome or shield, which presents on the

concave a somewhat reticulated character, the pupa remains until ready for its further development, when it escapes by forcing its passage through the apex of the cone. The woolly material alluded to is composed of solid filaments, more or less striated transversely, and in some instances distinctly corrugated or beaded. They give a faint series of colors by polarized light, and when submitted to the action of iodine, immediately become intensely blue.

These varieties of Manna are of no medicinal value, and apart from their consideration as objects of natural interest and curiosity, have obtained but little notice.

ESSENTIAL OILS.

The substances belonging to this class which have come under the notice of the Jurors form a series of much interest and practical importance, whether they are regarded from a scientific point of view or with reference to the extension of Victorian manufacturing industry. The many advantages this country offers for the economic production of such substances may be realized, when it is remembered that the plants supplying volatile oils are not the result of artificial culture in this country, as they often are in others, but constitute the great bulk of our forest vegetation. It is not often that the foliage of large trees can be turned to useful account, and whenever they are felled in quantities for timber, the leaves give rise to serious inconvenience; yet it is from such material that the greater number, and the more important of the oils exhibited in this class, have been obtained. If, notwithstanding the unlimited supply of leaves furnished by the myrtaceous vegetation of the Colony, the yield were too small, it would render the distillation of essential oils but doubtfully remunerative. It will be seen, however, that this difficulty does not exist, for the produce is in most cases unusually large and copious.

The exhibits under review, numbering thirty-five in all, have been furnished, with one exception, by Mr. Joseph Bosisto, of Richmond, and Mr. William Johnson, of St. Kilda, to whom the Jurors have awarded first-class certificates for the superior excellence, novelty, and importance of their productions. The labors of these gentlemen were undertaken at the suggestion of Dr.

Ferdinand Mueller, to whose untiring energy and foresight the Exhibition is indebted for this most interesting display, which has occupied several months in preparation. Dr. Mueller has also supplied the leaves from which the volatile oils have been distilled, thereby removing any uncertainty which might exist regarding the true botanical name of the tree from which the samples were obtained—facts which greatly enhance their value.

The method pursued in the production of these oils does not differ in any of its details from that in common use for the manufacture of such liquids. A quantity of the material to be operated upon is introduced with water into an ordinary still, to which a worm is adapted; upon the application of heat the volatile oil passes over and condenses with the aqueous vapor, and from the watery portion of the distillate, is ultimately separated by mechanical means.

Of the properties and individual characteristics of these exhibits, little or nothing has hitherto been known, as no sample of these oils has been produced, with the exception of one, which was forwarded to the Victorian Exhibition of 1854, for transmission to Paris, and was oil from the Red Gum, distilled by Mr. Bosisto, at the suggestion of Dr. Mueller, who was the first to draw attention to this important subject.

The Jurors have therefore deemed it advisable to institute into the chemical and physical properties of these indigenous vegetable productions, accurate investigations, which have been made as comprehensive as time and the resources at their command permitted. These researches have been undertaken solely with regard to the technological value of the substances experimented upon; and it is hoped, that though far from complete, or exhaustive of the subject, they will serve to guide manufacturers and others in forming an estimate of the capabilities and characteristic peculiarities of this interesting series of productions. For the botanical information embodied in their Report, the Jurors are indebted to the kindness of Dr. Mueller; and from Messrs. Johnson and Bosisto they have obtained the facts relative to the yield from each sample of vegetable material subjected to distillation.

For practical purposes it will be found convenient to divide the Essential Oils into two classes, and to consider each separately, as follows, viz., into those capable of general application in the arts, and those likely to be found useful in medicine and perfumery.

A.

ESSENTIAL OILS FROM THE GENERA EUCALYPTUS AND MELALEUCA, SUITABLE FOR GENERAL APPLICATION IN THE ARTS.

These oils, consisting of nineteen varieties, are included in this class not only on account of their properties, which fit them for the manufacture of varnishes and for illuminating purposes, but because the trees and shrubs from which they are derived are so widely distributed, and obtainable in such quantities, as to render it probable that the oils can be produced at a cost enabling them to compete commercially with similar products of other countries.

In the following series, in which each of the oils is made in turn the subject of a short descriptive notice, the only classification observed has been the description separately of the oils of the Eucalypti, and those of the genus Melaleuca, beginning, in each case, with such of the species as from their productiveness appear to be the most important.

Eucalyptus amygdalina (*Tasmanian Peppermint*, *Dandenong Bastard Peppermint*).—The tree, from the leaves of which this oil is obtained, occurs chiefly in the southern districts of the Colony of Victoria, and is common in Tasmania; it occupies open and undulating forest land, and is always interspersed with other trees, and is one of the least valuable of the Eucalypti, considered in reference to its timber. On the other hand, its yield of essential oil is astonishingly plentiful, 100 lbs. of the freshly-gathered leaves, inclusive of the small branchlets to which they are attached, giving upwards of three pints, imperial measure. The oil exists ready formed in the leaf, and the cells containing it may be seen in great numbers on examination by transmitted light.

A photograph of the E. amygdalina, from Dandenong, is annexed, produced by simple superposition, which conveys an excellent idea of the number and size of the oil-cells, and the structure and character of the leaves generally. This oil is a thin transparent fluid of a pale yellow colour, possessed of a pungent odor resembling that of oil of lemons, but coarser and stronger; its taste is rather mild and cooling, producing an after sensation in the mouth resembling camphor, with something of its bitterness. Its specific gravity at 60° F. is 0·881. It boils freely at 330°; but as the evaporation proceeds, the mercury rises rapidly to 370°, where it remains almost stationary. Cooled to 0° F., it at first

becomes turbid, and then clearing, deposits a white flocculent substance, which melts at + 27° F. Suffered to evaporate spontaneously, it proves to be somewhat less volatile than oil of turpentine. Like other essential oils, it leaves no stain on paper, and in shallow vessels it absorbs oxygen, giving rise to a residual resinous matter. When brought in contact with iodine no explosion ensues, even when the temperature is raised; but a dark-colored solution is created, which, when heated, emits peculiar variegated vapours, in which the colors yellow, red, violet, green, and blue are very beautifully visible, particularly in bright sunlight.

The essential oil of E. amygdalina is soluble in all proportions in turpentine, both fat and drying oils, benzine, naphtha, ether, chloroform, and absolute alcohol. Spirits of wine also dissolves it pretty freely; and water, on being agitated with an excess, takes up 1·1 per cent. by weight, or two drachms to the imperial pint.

This oil, when exposed in a shallow vessel, is ignited with great difficulty, by means of a burning match of wood or paper: in this way it cannot be made to take fire by contact with a flame until it has become quite hot. When it does burn under these circumstances, it produces a bright flame, with much smoke. When burned in a kerosene lamp, it gives a flame very nearly as luminous as that from American kerosene, but somewhat yellower, and inclined to smoke: a slight addition to the height of the chimney obviates this defect. The solvent powers of this and the other oils from the genera Eucalyptus and Melaleuca constitute one of their most important characteristics, which will doubtless be turned to account in the preparation of varnishes and hackers, provided the cost of production does not exclude their use for such purposes.

To enable manufacturers and technical men to estimate the capabilities of this as compared with the liquids usually employed for dissolving resinous substances, an extended series of experiments have been undertaken, the results of which are embodied in the subjoined table. In reference to this table, it is necessary to state that the exact saturating quantity of some of the substances there specified is obtained with much difficulty and loss of time, because the solution gradually increases in viscidity, while the solvent power of the oil proportionally diminishes; but in every case the resin undergoing investigation was added until a portion of it remained for two or three days unacted upon. It

will also be seen that the solutions were effected at ordinary temperatures, and the results produced by the action of different degrees of heat are not included in the category of facts, because to have done so would have extended this portion of the inquiry beyond all reasonable limits. Those persons who are conversant with this subject will, it is believed, be able to deduce from what is here stated the information they require. In those cases in which only part of a resin is taken up by the essential oil, the determination of the quantity dissolved has been made by evaporating carefully a measured portion of the solution to dryness, and weighing the residue, after heating it until decomposition had just commenced.

TABLE SHOWING THE SOLUBILITY OF RESINOUS SUBSTANCES, AT ORDINARY TEMPERATURES, IN THE ESSENTIAL OIL OF EUCALYPTUS AMYGDALINA.

Name of Resinous Substance.	Number of ounces avoirdupois soluble in 1 imperial pint.	Remarks.
Camphor	23·3	Thin, transparent, almost colorless; solution perfectly saturated at about 70° F.
Rosin	20·3	Oily solution.
Mastic	17·5	Perfect solution, very viscid.
Victorian Sandarac (from the Callitris verrucosa)	11·6	Beautiful clear yellow solution, very viscid.
Elemi	10·2	Oily solution.
Sandarac (ordinary)	7·3	Fine viscid solution.
Kaurie Gum (from New Zealand)	7·3	Beautiful clear solution, exceedingly viscid. This resin dissolves with great readiness in the essential oil.
Damara (ordinary)...	7·3	Fine solution, as thick as castor oil.
Asphalt	5·8	Perfect solution, almost opaque, and very thick.
Grass-tree Gum (from Victoria)	5·2	This resin is not completely soluble in amygdalina; to obtain a saturated solution it must be used greatly in excess. The solution is oily, and of a beautiful transparent red color.
Dragons blood ...	4·3	Beautiful solution, obtained by using a moderate excess of the resin.
Benzoin	2·8	A portion only soluble; the concentrated solution is obtained by treating a large excess; yellowish oily liquid, very clear.
Copal (sample No. 1)	1·94	Clear, viscid, colorless solution, some samples more soluble than others; in all cases a few clear gelatinous particles sink to the bottom, and remain undissolved even on dilution. The solution takes place very rapidly.
Ditto (sample No. 2)	1·33	

SOLUBILITY OF RESINOUS SUBSTANCES—*continued.*

Name of Resinous Substance.	Number of ounces avoirdupois soluble in 1 imperial pint.	Remarks.
Amber	1·74	About one quarter of the amber soluble; it must be used in excess to obtain a concentrated solntion.
Anime	1·45	This resin is soluble only in part (abont 67 per cent.), the remainder gelatinizes, and remains for a long time in suspension. These particles, although they swell very mnch, do not lose their granular form nearly so much as those which form the insoluble portion of copal.
Shell-lac	1·16	Obtained by digesting a very large excess, rednced to a fine powder; a small portion only of the lac being soluble, and that with great difficulty. The color of the solution is pale orange.
Caouchouc	0·73	A perfect solution, but very viscid.
Beeswax	0·73	Slightly turbid. The essential oil is capable of liquifying many times this quantity, but the tnrbidity of the solution increases very much, and it becomes thicker, ultimately refusing to flow.
Gutta Percha ...	0·0	Digestion for several days produced no effect.

The number of substances enumerated in the preceding table, and the completeness of the observations generally which have been made on E. amygdalina, will be found greater and fuller than those brought under notice in the descriptions of any of the following oils, and reference will be made to this one when speaking of the others; in fact the essential oil of E. amygdalina has been accepted as a type of all those included in the class A, at present under consideration.

Mr. Hugh Gray, of Ballaarat, exhibits an oil distilled by him from one of the Eucalypti, which Dr. Mueller believes to be the E. amygdalina, judging from leaves of the tree forwarded to him. In yield this tree is very inferior to that which has just been described, 100 lbs. of the leaves in the dry state giving 31 ounces 2 drachms of oil; in other respects bearing a close resemblance to it. The specific gravity of this sample is 0·907; it boils at 320°, the mercury rising to 385°. A comparison of this with the preceding oil suggests the idea that a portion of the volatile contents

of the leaves may have been lost by the drying process to which they were subjected.

Eucalyptus oleosa (Mallee Scrub).—This species of Eucalyptus furnishes an essential oil which undoubtedly ranks first in importance amongst those submitted to the Jurors. The interest which attaches to it arises from the fact that greater facilities are offered for collecting the leaves from which it is distilled than is the case with those furnishing the other oils forwarded to the Exhibition.

The E. oleosa covers the greater part of the vast tracts of level country towards the north-west of Victoria, forming, with the species E. dumosa (Cunn.), and E. socialis (F. M.), the dense masses of vegetation known as Mallee Scrub. Its dimensions require it to be ranked as a shrub, as it rarely exceeds twelve feet in height; but from the circumstance that the individuals of the species are clothed with foliage to the ground, and often grow so closely together as to form impenetrable masses of vegetation, an exceedingly large quantity of the leaves can be procured in a short space of time, without moving far from one locality in search of them; and this supply could be maintained from day to day, as required for distillation, almost without limit.

Besides the favorable influence which the shrubby character of this plant exerts upon the cost of the raw material, the manufacturer of this oil upon a large scale would derive great benefit from the water-carriage which the River Murray furnishes for the transport of produce, and the constant and peculiarly abundant supply of water indispensable for purposes connected with the distillation and refrigeration of the oil.

The River Murray, in Victoria alone, is for about 270 miles of its course covered on its southern bank with Mallee Scrub, receding in some cases to a short distance inland, whilst in others it comes down to the water's edge. Under conditions so favorable, it is certain that the oil can be produced at a very inconsiderable cost.

The physical and chemical properties of the essential oil of E. oleosa do not differ materially from the preceding. It is a thin mobile liquid, of a pale yellow color; mild in taste as compared with others of this class, the flavor being camphoraceous, and also suggestive of oil of turpentine in a slight degree.

Its odor, which is distinctly mint-like, is not so agreeable as that of E. amygdalina. The yield of the shrub, though inferior

to that of the Dandenong Peppermint, is still very large, 100 lbs. of the green leaves and branchlets giving 20 ounces of oil. Its specific gravity is 0·911, and it boils freely at 322°, the temperature gradually increasing until it remains stationary at 350°.

Burned in a kerosene lamp, this volatile fluid produces a fine luminous flame, superior in color to that emitted by the preceding oil under similar circumstances, and totally devoid of smoke or smell. It is an excellent solvent for resins, but accurate determinations of the quantities of such substances taken up by it have not been made.

A photograph of one or two leaves of this plant accompany the Report, showing the oil cells, which are very abundant and large, and render the name bestowed by Dr. Mueller upon this species of Eucalyptus peculiarly appropriate.

Its habitat extends from the Murray to the south of Lake Hindmarsh, and to Spencer and St. Vincent's Gulfs, in South Australia; it also occurs in the vicinity of Lake Torrens, and in the neighborhood of the Darling and Murrumbidgee. It is essentially a desert species, and is not found in Tasmania.

Eucalyptus sideroxylon (*Ironbark*).—In productiveness this tree ranks next in the series, 16 ounces 7 drachms having been obtained from 100 lbs. of the leaves alone. This amount should be taken as only approximative, for the green material, closely packed, having to be transported for a considerable distance, had suffered fermentation, and, owing to the heat evolved, to an extent certain to have acted disadvantageously upon the yield of oil.

The specific gravity of Ironbark oil is 0·923; it boils at 310°, the mercury afterwards rising to 352°. In taste and smell it closely resembles that from Mallee Scrub. It is a thin, limpid, very pale yellow fluid, igniting with great difficulty in open vessels, but burning well and with a dense white luminous flame in the lamp. The Ironbark tree occurs on barren ranges, and is frequent in the vicinity of the gold-fields.

Eucalyptus goniocalyx (*one of the White Gums*).—The yield from the leaves of this tree is not so copious as that from E. amygdalina, although still very considerable; 100 lbs. of fresh leaves give a product measuring 16 ounces. This oil is of a very pale yellow color, with a pungent penetrating odor, rather disagreeable; its taste is diffusible, strong, and exceedingly unpleasant. Its

specific gravity is 0·918; it boils at 306°, after which the mercury rises to 346°. For illuminating purposes this oil is admirably adapted; it produces a brilliant white flame, superior in intensity and color to that from the best American kerosene; its consumption in one of these lamps does not cause any smoke or smell. This tree is scattered over the mountain ranges of Victoria, but is not known in Tasmania. It is in some places rather abundant, being found from the Buffalo Ranges to the Mitchell River, in Gipps Land; also in the district of the Upper Yarra.

Eucalyptus globulus (*Blue Gum*).—Two specimens of this volatile oil have been forwarded to the Exhibition: No. 1 is from the leaves of young trees, and No. 2 from those advanced in growth. Annexed to the Report will be found photographs of both, in which the oil-cells are easily discernible. The cells in the younger leaves are remarkable for their size, but a larger yield of oil is obtainable from those more perfectly matured: this amounts to 12½ fluid ounces from 100 lbs. of freshly-gathered material. The essential oil from the Blue Gum must be regarded as one of the most important of this series, on account of its solvent and illuminating properties, and also in consequence of the large demand for Blue Gum timber, which occasions the felling of many trees of this kind, so that in some localities leaves of the E. globulus, which are utterly wasted at present, are to be had in great abundance. This oil is a thin limpid fluid, of a very pale yellow tint, almost colorless in the case of the sample from the young leaves; its odor is like that of cajuput, to which all the oils from the Victorian Eucalypti have more or less resemblance. In E. globulus the camphor-like smell predominates; its taste is not so disagreeable as the preceding, and more cooling and mint-like.

The specific gravity of this oil is 0·917; it boils more readily than the E. amygdalina, viz., at 300°, the mercury rising only to 350°. The sample from young leaves differs slightly in these respects. Reduced in temperature to 0° F., it remained clear, and deposited no solid matter. In contact with iodine, this oil acts like amygdalina, and it is equally difficult to ignite in open vessels. In a lamp it gives a dense white flame, superior to kerosene, without smoke or smell. Its solvent capabilities are detailed in the following table. It is worthy of remark, that it

dissolves Grass-tree resin perfectly, in which it differs materially from E. amygdalina.

TABLE SHOWING THE SOLUBILITY OF RESINOUS SUBSTANCES, AT ORDINARY TEMPERATURES, IN ESSENTIAL OIL OF EUCALYPTUS GLOBULUS.

Name of Resinous Substance.	Number of ounces avoirdupois soluble in 1 imperial pint.	Remarks.
Camphor	14·5	Thin solution, perfectly saturated at about 70° F.
Mastic	12·7	Fine solution, easily effected, of the consistency of honey.
Kaurie Gum (from New Zealand)	8·0	This resin dissolves with great readiness; the solution is very viscid, flowing with difficulty.
Sandarac (ordinary)	7·3	Oily solution. This resin is taken up more slowly than the preceding.
Grass-tree	6·5	This gum completely dissolves, giving a deep red viscid liquid, almost opaque.
Asphalt	6·5	A thick opaque solution. It is very probable that the oil would take a greater quantity than that here given, but it is not possible to see when the asphalt ceases to dissolve.
Copal (sample No. 2)	1·02	The resin in this case must be used in excess. The soluble part of it gives, with the oil, a perfectly colorless oily solution. By continued digestion for several weeks, so considerable a portion of the gelatinized residue is taken up, beyond the amount given in the table, as to make E. globulus appear to be the best solvent of copal.
Anime	0·81	This resin behaves in a manner somewhat resembling that just described, save that the gelatinized insoluble portion retains its pulverulent form, although very much swelled and softened. About 55 per cent. of anime is dissolved in this volatile oil.
Shell-lac	0·13	Pale, bright, amber-colored solution, very thin; it can only be obtained by digesting a large excess of the finely-powdered resin.
Gutta Percha ...	0·0	No solvent action.

Eucalyptus corymbosa (*Bloodwood*).—The leaves from which this sample of essential oil was produced had suffered decay to even a greater extent than those used in the preparation of the oil of the Ironbark tree, and it is believed that this circum-

stance gave rise to the formation of certain resinous matters which passed over with the products of distillation, increasing in the form of minute grains, the bulk of the oil. The yield from 100 lbs. of leaves was therefore as follows:—pure limpid oil 9 ounces 3 drachms, oil containing resinous matter in suspension 6 ounces 2 drachms; of the latter fifty per cent. of its volume may be estimated as consisting of solid matter, upon which assumption the total yield may be approximatively stated as 12 ounces 4 drachms.

In odor this sample of oil differs greatly from all the oils of this class, so much so that it could hardly be recognised as of Eucalyptine origin. Its smell in relation to the others is much fainter and milder, and while partaking slightly of the lemon odor of the E. amygdalina, combined with a trace of attar of rose, it wants altogether the characteristic pungency and freshness of its congeners.

The taste of this oil is slightly bitter, producing the usual after taste of peppermint, and irritating the throat; but it is not so pungent and diffusible as many others. It is a colorless and limpid fluid, and its specific gravity, which is below the average, is 0·881 at 60° F. It is found along the North-eastern boundary line of this Colony and extends thence into New South Wales.

Eucalyptus fabrorum (*Stringybark*).—What has been said of the facilities offered for obtaining leaves from the Blue Gum is equally applicable to those from the Stringybark; the cost of such would not be great if the apparatus for distillation were erected in the vicinity of saw mills or where the wood splitter prosecutes his business. The Stringybark has a much wider range than many of the Australian Eucalypti, and is moreover quite gregarious, forming the main bulk of the timber in the barren mountainous districts; it is known from Spencer's Gulf to New South Wales, and extends also into Tasmania.

The essential oil from E. fabrorum is a transparent reddish-yellow fluid of a mild odor, as compared with goniocalyx and globulus, and much less disagreeable. In taste it resembles the other Eucalyptine oils, but is rather more irritating in the mouth, and also distinctly bitter though less unpleasant. Its specific gravity is 0·899, and its boiling points are respectively 340° and 382°; cooled to 0° F. it becomes turbid and opalescent. It will be

perceived that this phenomenon which also takes place with E. amygdalina, harmonizes with the high boiling points which they both possess, whilst globulus which boils as low as 300° does not separate any frozen portion when cooled to zero.

With iodine this oil behaves as does amygdalina. In the lamp it gives a fine flame, but one not quite so white as that from E. goniocalyx and E. globulus. 100 lbs. of freshly gathered leaves from the Stringybark tree yield 8 ounces of oil. Its solvent properties, with a selection of resinous bodies, will be found noted in the subjoined table:—

TABLE SHOWING THE SOLUBILITY OF RESINOUS SUBSTANCES, AT ORDINARY TEMPERATURES, IN ESSENTIAL OIL OF EUCALYPTUS FABRORUM.

Name of Resinous Substance.	Number of ounces avoirdupois soluble in 1 imperial pint.	Remarks.
Camphor	21·8	A perfectly satnrated solution, thin and clear; temperature about 70°.
Mastic	16·4	Pale yellow solution, clear and bright, of the consistence of oil.
Sandarac (ordinary)	10·9	Rather more viscid than the preceding.
Kaurie Gnm (from New Zealand)	10·2	Beautiful transparent solution, exceedingly viscid.
Grass-tree	7·6	This resin is totally soluble in the essential oil of E. fabrorum, producing a liquid of a deep red color, almost black.
Anime	1·09	Golden yellow solution, a portion only of the resin being soluble (about 75 per cent.), the insoluble portion being much swelled and gelatinized.
Shell-lac	0·98	Dark amber-colored liquid, only obtained when a large excess of the resin is employed. The undissolved portion softens and aglutinates together, adhering fast to the sides of the vessel nsed for the digestion
Copal (sample No. 2)	0·76	This resin behaves as anime does; abont 50 per cent is solnble in the volatile oil.
Gutta Percha ...	0·0	No solvent action.

Eucalyptus fissilis (*Messmate.*)—This oil bears a strong resemblance to the preceding; its yield is the same, viz.:—8 ounces from 100 lbs. of leaves. Its color is a pale reddish-yellow, and its smell is mild and rather agreeable, like fabrorum. In taste it is also very similar, attacking the throat. Its specific gravity is

0·903 at 60° F. and it boils at 350° the temperature rising until it reaches 386°.

The essential oil of E. fissilis is a good solvent for resins, but no exact quantitative determinations have been made with it. The Mesmate tree occurs under the same conditions as Stringybark.

Eucalyptus odorata (Peppermint).—The Peppermint tree extends from New England through Australia Felix as far as Spencer's Gulf, is not known in Tasmania, forms in open reaches park-like scenery; but contrary to what might have been anticipated, the quantity of oil furnished by the leaves of this species of the Eucalyptus is not large; the two samples forwarded differ so much in this and other respects that a brief description of each will be necessary. The specific gravity of the oil marked No. 1 is only 0·889, and its boiling points are respectively 335° and 390°; its consumption in a lamp does not give rise to quite so brilliant and white a flame as that from good kerosene. The yield is small being only $5\frac{1}{2}$ drachms from 100 lbs. of the fresh leaves, while in the case of No. 2, a similar quantity of leaves yielded 4 ounces $1\frac{1}{3}$ drachms. This discrepancy is not easily accounted for, and is possibly due to accidental circumstances. Both samples of oil have a pale yellowish color, inclining slightly to green; they are limpid fluids, and diffuse an aromatic smell in which one resembling that of camphor predominates. The taste is like that of fabrorum, but milder. The specific gravity of the sample No. 2 of this essential oil is 0·922. It boils at 315° and as the evaporation proceeds the temperature rises to 356°. It is acted upon by iodine in a manner similar to amygdalina. In a kerosene lamp it gives a very brilliant white light, and burns exceedingly well.

Eucalyptus Woollsii (Woollybut).—The tree, from the leaves of which this oil is distilled has but a limited range in Victoria; it is met with in the North-eastern portion of Gipps Land, and accompanies the Bloodwood into New South Wales. The sample of oil submitted to the Jurors exhibits the remarkable property of imparting an indelible transparent stain to paper, indicating that a resin is probably held by it in solution. This opinion is stregthened by the unusually high specific gravity which it possesses, namely:—0·940; and by the fact that its boiling points are also much above the average, being 380° and 420° respectively. The

taste of this essential oil is aromatic, and cooling, with but little pungency; it has a fragrant camphoraceous odor, and an oily consistency. The yield from 100 lbs. of leaves (those used having suffered slightly from close packing), is 3 ounces 3¼ drachms. In a kerosene lamp this fluid gives a good bright clear flame, but somewhat inferior to kerosene in intensity.

Eucalyptus rostrata (*Red Gum*).—Like that from the Peppermint this oil is represented by two samples, which differ chiefly in color; that of No. 1 being pale yellow, while No. 2 is of a reddish-amber tint. In smell it is hardly distinguishable from odorata, and the same may be said of its taste. The yield from 100 lbs. fresh leaves of the Red Gum is not large, as compared with many of the oils above described, amounting to 1 ounce 4½ drachms. The specific gravity of this oil is 0·918; its boiling point is the lowest of any, being 280°, the mercury afterwards became stationary at 358°. A portion which had been rapidly evaporated to about one fourth its bulk, almost gelatinized when reduced to zero, without losing its transparency. This oil burns very well.

The Red Gum has a wider range than any other of the Australian timber trees, being equally common within and beyond the tropics, and is usually found on the banks of rivers; it does not occur in Tasmania.

Eucalyptus viminalis (*Manna Gum*).—A pale yellowish-green oil, the smell of which is disagreeable, but not very strong or penetrating. In taste it resembles odorata. Its specific gravity is 0·921, and its boiling points 318° and 360°. The yield is the least of any, being only 5¼ drachms from 100 lbs. fresh leaves. It burns very well in a lamp.

This Eucalyptus is to be met with on grassy reaches, often interspersed with odorata; it is found also in New South Wales, South Australia, and Tasmania.

Melaleuca linarifolia.—The extraordinary large yield of oil which the leaves of this shrub supply, as compared with the quantities obtainable from others of the Tea-tree genus, naturally place it at the head of the list; 100 lbs. of fresh branchlets and leaves giving a product measuring 28 fluid ounces. It presents the appearance of a very light straw-colored mobile fluid, of rather a pleasant odor resembling the oil of cajuput, but less aromatic and pungent, and possessed of a singularly agreeable taste—in which

respect it differs from most of the other oils—strongly suggestive of both mace and nutmeg, followed by the usual mint-like after-taste, common in a greater or less degree to the mrytaceous oils. The specific gravity of the liquid under consideration is 0·903, the lower of its two boiling points is unusually high being 348° while the interval between it and the temperature at which the mercury ceases to rise, is very much narrower than the average, comprising only 21°.

This essential oil burns well in the lamp, as far as color is concerned, but its illuminating powers appear to be slightly inferior to good kerosene. This shrub is restricted to East Gipps Land and New South Wales, where it forms large bushes along some of the rivers.

Melaleuca curvifolia.—The product obtained from the distillation of the leaves and branchlets of this plant is of an oily consistency, and amber-color; and, like E. Woollsii, leaves a transparent stain on paper, which peculiarity is probably due to a similar cause. Its specific gravity is considerable, being 0·938; it boils at 364° and 408°, which are remarkably high, being each of them upwards of 40° above the average boiling points of the eucalyptine oils, thus maintaining its similarity to the E. Woollsii. The yield from 100 lbs. freshly-gathered material is 5 ounces 7½ drachms. The taste of this oil is not disagreeable, and resembles cajuput very closely. It is a good solvent for resins.

This species of Tea-tree is found on the coast of Victoria, where it sometimes forms fine umbrageous trees; it also grows in desert regions, where it is of scrubby habit. It seems to prefer a saline soil.

Melaleuca ericifolia (*Common Tea-tree of the Colonists*).—The shrub from which this oil is extracted is very plentiful, and widely distributed. It inhabits vast tracts of swampy and often sub-saline country, and gives rise to the term "Tea-tree Swamp:" it is remarkable for growing actually in water. It is also found in Tasmania and New South Wales, seldom exceeding the size of bushes, and penetrates along the watercourses into the ranges. It could be collected in very large quantities without difficulty. The minuteness of its leaves renders it necessary to introduce the smaller branches with them into the still, so that the yield of oil, which amounted to 5 ounces from 100 lbs. of fresh material, is

therefore much less than it would be, could the leaves be operated on alone, as they do not constitute more than about a fourth of the weight of the whole. This remark is true of many of the plants of this genus, but more especially so of the Ericifolia, as its leaves are smaller than those of any other, samples of the oil of which have been forwarded to the Exhibition; it may also help to account for the very great difference in the quantity obtained by each of the exhibitors.

The oil bears a striking resemblance to the cajuput of commerce, obtained from the Melaleuca leucadendron of the Moluccas. The color of the product from this species of Tea-tree is a very pale yellow; its smell is like cajuput, but somewhat less agreeable; its taste is bitter and camphoraceous, followed by a cool sensation, like that produced by peppermint, but the similarity to camphor is less perceptible, both in smell and taste, than it is in cajuput. This volatile oil is thin, but not as mobile as others; its specific gravity is 0·899 to 0·902, at 60° F., and it boils freely at about 300°, the mercury rising to 362°. In shallow vessels it is as difficult to ignite as any of the preceding oils from the genus Eucalyptus, but in a common kerosene lamp it burns very well, with a dense white flame, giving rise to neither smoke nor smell.

When iodine is brought into contact with it, at ordinary temperatures, reddish fumes are perceptible, without any explosion; by raising the temperature, variegated vapors are emitted similar to those already described.

It is worthy of remark, that the distillation of cajuput from the leaves of the Melaleuca leucadendron is conducted in a manner differing from that which has been pursued in the production of the Victorian oils, as in that case the leaves of the plant are allowed to heat in sacks, and are subsequently macerated in water, and fermented for a short time before the distillation is commenced. The object of this treatment is probably to increase the yield, and facilitate the escape of the oil; but it should be remembered that the productiveness of the M. leucadendron is not large, viz., scarcely 3 drachms from two sacks full of leaves; while the yield from M. ericifolia, and one or two other species, must be at least from twenty to one hundred times as great. It will be seen from the following table that this oil is not inferior to any of the preceding as a solvent of resinous substances.

TABLE SHOWING THE SOLUBILITY OF RESINOUS SUBSTANCES, AT ORDINARY TEMPERATURES, IN ESSENTIAL OIL OF MELALEUCA ERICIFOLIA.

Name of Resinous Substance.	Number of ounces avoirdupois soluble in 1 imperial pint.	Remarks.
Camphor	18·9	Thin limpid solntion, perfectly saturated at about 70°.
Mastic	15·3	Very soluble, forming a viscid, clear solution.
Kaurie (from New Zealand)	10·2	This resin dissolves with readiness; its solution is very viscid, and of a pale, clear, reddish-yellow color.
Sandarac (ordinary)	8·7	Perfect solution, somewhat thinner than the preceding, bnt thicker than that of mastic.
Grass-tree	6·5	This resin is totally soluble in the oil of M. ercifolia, giving rise to a liquid of a very deep red color, thicker than oil.
Anime	1·02	This resin is not totally soluble at ordinary temperatures; a little more than half of the qnantity used was taken up to produce a solution of the strength indicated. The undissolved portion passes into a very bulky gelatinous state.
Shell-lac	0·95	The portion of shell-lac which is taken up by this solvent forms with it a transparent, deep amber-colored fluid, of the consistence of oil; to obtain it the resin mnst be nsed in excess, and in a finely divided state.
Copal (sample No. 2)	0·82	Gum copal is rapidly acted upon by this volatile oil, but only a portion enters into perfect solution (about 56 per cent.), the remainder remains suspended in a very gelatinous, transparent state.
Gutta Percha ...	0·0	No solvent action.

Melaleuca Wilsonii.—The productiveness of this shrub is tolerably great, bearing in mind the fact already stated that a large portion of the material weighed into the still consists of stems and twigs, which, although they appear to contain a little oil, as is the case with all the plants of this genus, must yet be regarded as relatively unproductive material. From 100 lbs. of the fresh green material 4 ounces of a pale yellow oil are obtained. In smell it is like curvifolia; its taste is very diffusible and pungent. Its specific gravity is 0·925.

This plant has been found hitherto only in the vicinity of Lake

Hindmarsh, and the Tatiara country, and the River Wimmera. It is a desert species.

Melaleuca uncinata.—This plant is essentially a desert species; it ranges from Victoria across the continent to Western Australia, and forms a slender and graceful shrub. The color of its essential oil is green, being in this respect exactly similar to cajuput, but in taste it resembles more the Eucalypti. In smell it is like M. ericifolia, with an addition of peppermint. The yield from 100 lbs. of the plant is approximately 1 ounce 6 drachms.

Melaleuca genistifolia.—100 lbs. of this shrub yield 1 ounce 2 drachms of a pale greenish-yellow oil, mild in odor and taste; but both characteristic of the Tea-tree oils. The quantity submitted for investigation was not sufficiently large to admit of determining its specific gravity and boiling points.

The M. genistifolia accompanies the M. linarifolia, but is rare in Victoria.

Melaleuca squarrosa.—This oil is also colored green. It resembles that of uncinata and ericifolia, but its taste is disagreeable; and, while it retains in this respect the character peculiar to the Tea-tree oils, its flavor is somewhat vapid. The yield from M. squarrosa is small, being only 5 drachms from 100 lbs. of the shrub.

This is one of the most common of the Tea-tree shrubs, being frequently found with ericifolia in Tea-tree swamps, although, unlike it, it assumes in deep forest dells the dimensions of a large tree.

Before passing from the consideration of the essential oils of this class, it is desirable to make some observations bearing upon their technical importance and general characteristics.

The similarity in the properties of the oils which have been described is so great, that the investigations made respecting them have failed to establish individual peculiarities, sufficiently marked to enable the chemist to distinguish with certainty between them, and tell by the examination of a sample the source from which it was obtained. In a practical point of view this want will be little felt, as for the manufacture of varnishes, the dissolving of india-rubber, or for illuminating purposes, they are almost equally valuable. The behaviour of these substances when subjected to the action of re-agents may be shortly stated as follows:—

With sulphuric acid at ordinary temperatures a gradual darkening in color is perceptible, the tint varying slightly according to the oil operated upon, but the final result is in all cases a deep

TABLE SHOWING THE PHYSICAL CHARACTERISTICS AND OTHER PARTICULARS RELATING TO THE ESSENTIAL OILS OF THE GENERA EUCALYPTUS AND MELALEUCA.

NAME OF ESSENTIAL OIL.	Locality whence obtained.	Month in which the leaves were gathered.	Yield from 100 lbs. of material.	Specific gravity at 60° F.	Boiling Temperatures. Lower.	Boiling Temperatures. Higher.	Relative Illuminating power; the flame of Kerosene = 1·000.	Color of flame; that of Kerosene being white.	By whom distilled.	Remarks.
			ozs.							
E. amygdalina (Dandenong Peppermint)	Dandenong ..	September	60·50	0·881	330°	370°	0·849	Yellow ..	Bosisto	This yield is estimated from fresh leaves and branchlets together; the flame has a tendency to smoke.
E. amygdalina	Ballaarat	..	31·25	0·907	320°	385°	1·028	White ..	Gray ..	Yield estimated from leaves only which had been dried in the shade.
E. oleosa (Mallee Scrub) ..	Murray District ..	January ..	20·00	0·911	322°	350°	1·080	White ..	Bosisto	Freshly gathered leaves and branchlets, brought a considerable distance, but in excellent condition.
E. sideroxylon (Ironbark) ..	Bendigo	December	16·88	0·923	310°	352°	1·090	Very white	Bosisto	From leaves only which had undergone fermentation.
E. goniocalyx (White Gum)	Dandenong ..	November	16·00	0·920	306°	346°	1·098	Very white	Bosisto	From fresh leaves and branchlets.
E. globulus (Blue Gum) No. 1.	Port Phillip ..	March ..	..	0·919	295°	346°	1·086	Very white	Bosisto	From fresh leaves only.
E. globulus .. No. 2.	Botanical Gardens, Melbourne	April ..	12·50	0·917	300°	350°	1·048	Very white	Bosisto	From fresh leaves only.
E. corymbosa (Bloodwood) ..	East Gipps Land ..	December	12·50	0·881	..	..	1·004	Yellow ..	Bosisto	Leaves and branchlets which had undergone partial decay; the flame has a slight tendency to smoke.
E. fabrorum (Stringybark) ..	Dandenong ..	September	8·00	0·890	340°	382°	0·870	Yellow ..	Bosisto	From fresh leaves only; the flame has a tendency to spread and smoke.
E. fissilis (Messmate) ..	Dandenong ..	September	8·00	0·903	335°	386°	0·908	Yellowish	Bosisto	From fresh leaves only.

E. odorata (Peppermint) No. 1	Port Phillip ..	August ..	0·69	0·889	335°	390°	0·850	Yellow ..	Bosisto	From fresh leaves only.
E. odorata .. .. No. 2	Port Phillip ..	August ..	4·17	0·922	315°	356°	1·158	Very white	Bosisto	From fresh leaves only
E. Woollsii (Woollybut) ..	East Gipps Land ..	January..	3·40	0·940	380°	420°	0·967	White ..	Bosisto	From leaves only which had suffered aligh injury from close packing.
E. rostrata (Red Gum) No. 1	Port Phillip ..	July ..	1·04	0·918	..	..	0·985	Very white	Bosisto	From fresh leaves only.
E. rostrata .. .. No. 2	Port Phillip ..	July ..	1·56	0·918	280°	358°	0·942	Yellowish	Bosisto	From fresh leaves only.
E. viminalis (Manna Gum)	Port Phillip ..	August ..	0·65	0·921	318°	360°	1·082	White ..	Johnson	From fresh leaves and branchle
M. linarifolia (Tea-tree) ..	Botanical Gardens, Melbourne	January..	28·00	0·903	348°	369°	0·982	White ..	Bosisto	From fresh leaves and branchlets brough a considerable distance.
M. curvifolia (Tea-tree) ..	Port Phillip Heads	November	5·90	0·938	364°	408°	1·031	White ..	Johnson	From fresh leaves and branchlets.
M. ericifolia (Common Tea-tree)	Port Phillip ..	October ..	5·00	0·902	300°	362°	1·017	White ..	Bosisto	From fresh leaves and branchlets.
M. ericifolia	Port Phillip ..	October ..	1·37	0·899	310°	350°	1·076	White ..	Johnson	From fresh leaves and branchlets.
M. Wilsonii (Tea-tree) ..	Wimmera ..	December	4·00	0·925	..	..	1·094	Very white	Bosisto	From fresh leaves and branchlets brought a long distance.
M. uncinata (Tea-tree) ..	Botanical Gardens, Melbourne	November	1·75	0·92	..	..	1·075	Very white	Johnson	From fresh leaves and branchlets.
M. genistifolia (Tea-tree) ..	Botanical Gardens, Melbourne	January..	1·25	..	..	..	..	..	Bosisto	From fresh leaves and branchlets.
M. squarrosa (Tea-tree) ..	Gipps Land ..	December	0·63	..	..	..	..	..	Bosisto	From dried leaves and branchlets.
Averages of Eucalyptus Oils obtained from the species amygdalina, oleosa, sideroxylon, goniocalyx, globulus, and fabrorum	..	..	22·31	0·908	317°	359°	1·006	..	..	Average interval between lower and higher boiling points 42° F.
Averages of Melaleuca Oils obtained from all the species	..	..	..	0·915	331°	372°	1·046	..	..	Average interva between lower and higher boiling points 41° F.

brown. When heat is employed, these changes are rapidly brought about; the acid is decomposed, giving rise to sulphurous acid gas, and the oil is converted into a charred mass, a part of which is dissolved by water, producing a liquid so dark as to be almost black.

Nitric acid acts but slowly in the cold; it gives rise when much concentrated to numerous shades of brown, olive, purple, violet, and grey; but when an addition of oil of vitrol is made, or when the nitric acid is employed at a temperature near its boiling point, the action is exceedingly violent; nitrous acid fumes are given off in great abundance, and the oil is converted into a brown resinous body of a pungent odor, hard and brittle, yet becoming plastic like pitch; soluble in alcohol and ether; fusing at a moderate heat, and inflammable; and possessed of marked acid properties, as it forms colored salts with the bases, and reddens litmus, in its alcoholic solution.

Hydrochloric acid does not give rise to very marked results on being simply added to one of these oils; but the effects produced by this re-agent have not as yet been studied to the extent they deserve.

Iodine has been already refered to.

What has been said of E. amygdalina, as to its solubility in various liquids, is true of the whole series.

If a piece of the metal sodium be introduced into one of these volatile oils, an evolution of gas instantly begins upon its surface, and this action is much aided by heat; it is not under any circumstances as energetic as that caused by the same treatment of some other essential oils, such as oil of cloves. The soda formed is taken up by the oil, giving rise to a dark brown liquid, from which water abstracts the color, and acquires alkaline properties. Solid potash aided by heat, and a solution of potash in alcohol, act very similarly as far as the change in color is concerned.

From what has been said it would appear probable that these volatile fluids must be regarded as oxygenated oils of very similar constitution, holding a camphor, or possibly a liquid carbohydrogen in solution, the proportion of which differs in the several varieties. The adoption of such a theory helps at least to explain the differences which exist, in bodies otherwise so similar in their boiling points, the separation of solid matter at low temperatures, and above all in the varying purity of color with which they burn in a lamp supplied with a constant amount of atmospheric air.

The table on pages 44 and 45 will be found to give concise information respecting some of the properties of these oils, and the circumstances under which they were produced.

With reference to the yield given in the fourth column of the preceding table, it should be borne in mind, that although the quantity obtained from each species has been determined with considerable accuracy, such results cannot be regarded as absolutely constant under all circumstances; for there can be little doubt that marked variations will be perceptible in the producing powers of oil-bearing trees, due to differences in age, in the localities where they grow, whether on high or low, moist or dry ground, in the time of year when the leaves are gathered, and in climatic influences generally. In addition to these, a direct cause of variableness is to be found in the proportion of branchlets introduced with the leaves into the still, or included in the calculation.

These are the causes which may have given rise to occasional anomalies, of which one or two instances will be found in the preceding table; but the manufacturer on the large scale will find that under like conditions the quantity he obtains may often exceed the yield as stated, but will very rarely fall below it.

The averages appended to the above table have been furnished solely for practical purposes; those belonging to the Eucalypti have been derived from the most common and important trees of that genus. In the case of the Tea-tree oils the yield has been omitted, in consequence of the great disparity which the species of that genus manifest in this respect, and from the fact that the species ericifolia exists in much greater profusion, and covers larger tracts of country than all the others taken together.

To enable a comparison to be made between the productiveness of Victorian plants supplying essential oils, and those of other countries, which are frequently dried before subjecting them to distillation, the following determinations of the loss in weight by drying Eucalyptus leaves in the shade have been made, and may be depended upon for their accuracy :—

E. amygdalina (Dandenong Peppermint) loses	50	per cent.
E. globulus (Blue Gum)	50	„
E. viminalis (Manna Gum)	41	„
E. rostrata (Red Gum)	58	„
Average loss by drying in the shade ...	50	per cent.

The photometric values of the flames produced by the combustion of these indigenous products have been obtained by comparing them with a kerosene lamp with a flat wick $\frac{5}{8}$ inch wide, and burning 318 grains per hour of kerosene of the best quality imported from America.

It is evident that such of the oils as give a yellow or yellowish light may be made perfect in color by a judicious admixture with others giving a purer flame, or by an alteration in the form of the lamp, and that consumed under such modified circumstances they would also emit a greater amount of light.

Regarding the suitability of these substances for illuminating purposes there can be no question, as they are possessed of all the valuable properties required for the economic production of artificial light. In efficiency and safety they equal the best kerosene, their odor being at the same time more agreeable, while unlike it they leave no stain upon paper or clothing. Endowed with so many advantages, their general adoption in place of lamp oil, kerosene, naphtha, and camphine, will depend solely upon the cost of their production; and without venturing to express a decided opinion upon a question of such difficulty, the successful solution of which depends upon an intimate knowledge of local circumstances, the jurors offer the following data, in addition to the information already given, with the view of enabling those who desire to pursue this subject further, to make the calculation of cost for themselves.

The apparatus required would consist of a still of large dimensions, which might be constructed of sheet iron, with a stout plate at bottom to resist the action of fire. Adapted to this a worm of very moderate size would be found sufficient, as the oils are easily condensed, and for refrigerating purposes a supply of cold water must be available, a small quantity being also necessary for the still. The price at which green leaves, which could be collected by women and young persons, can be delivered at the manufactory, constitutes the chief item in the calculation of expense. To facilitate its estimation the following weights may be stated as the results of actual experience:—a sack, capable of containing 200 lbs. of flour, when closely packed with fresh green leaves only, weighs from 90 to 100 lbs., with Eucalyptus leaves and branchlets together from 50 to 60 lbs. Of the freshly gathered material used for the production of two of the Tea-tree oils,

(linarifolia and genistifolia), the leaves alone amounted in weight respectively to 41 and 48 per cent. of the whole, the stems making up the rest; from 70 to 80 per cent. may be received as equally applicable to Eucalyptus leaves and branchlets, without involving an important error. The question of cost will be also materially affected, should the residual decoction remaining in the still, after the expulsion of the volatile contents of the leaves, be applicable to some useful purpose. The liquid referred to contains a very considerable quantity of extractive and astringent matter in solution, which might be turned to account in a variety of ways; but until more is known of its constituents and properties, it would be premature to bring its value into calculation.

As information having an important bearing upon this part of the Report, the jurors annex with much pleasure the following statement, for which they are indebted to A. J. Skene, Esq., of the Survey Department, of the areas covered with vegetation within Victoria. Mr. Skene's well known professional talents, and intimate knowledge of the whole face of the Colony, impart a high value to the information he has supplied.

TABULAR STATEMENT OF THE APPROXIMATE EXTENT OF COUNTRY COVERED BY THE SEVERAL DESCRIPTIONS OF VEGETATION IN VICTORIA.

	Acres.
Morasses, Lakes, and Lagoons	402,000
Dense Mallee Scrub	5,560,000
Mountain Ranges densely wooded with Gum ...	6,225,000
Open Timbered Country	38,922,000
Open Plains devoid of Timber, including Heaths ...	4,470,000
Tea-tree Scrub	65,000
Total	55,644,000

From the foregoing table it will be seen that about 12,000,000 acres of land, namely the mountainous tracts, and those covered with Mallee and Tea-tree Scrub, are densely clothed with myrtaceous vegetation, in the foliage of which enormous quantities of valuable volatile oils are stored.

The suitability of these substances for the manufacture of varnishes has been frequently referred to already; in addition it may be remarked, that most if not all of the refractory resins which are but little acted on by them at ordinary temperatures

yield to their solvent action, when previously fused in the manner commonly practised by varnish makers.

Gutta Percha, which is not affected by a lengthy digestion in the cold, is easily taken up when the temperature is raised, although a large portion appears to be again deposited when the liquid has cooled and remained for some time in a state of rest. The most exceptional and important property which the Victorian oils exhibit in their relations with resinous substances, is the power they possess of dissolving the fossil Kaurie Gum (Damara Australis) of New Zealand. This substance can be obtained at a very low price, from £10 to £12 per ton; but the difficulty of bringing it into perfect solution, has hitherto retarded its exportation in large quantities. The solution of the above named resin, bears dilution with very strong alcohol, ether, and chloroform to any extent, and about 30 per cent of turpentine may be added with safety; but 50 per cent. of that solvent throws down the resin as does spirits of wine, benzine, linseed oil, and coal oil, (kerosene). The solution of sandarac may be diluted with strong alcohol; but turpentine and linseed oil cause the deposition of the resin. Asphaltum is thrown down by absolute alcohol; but turpentine may be added with impunity. Grass-tree resin on the contrary is held in solution by alcohol, but will not bear dilution with turpentine or linseed oil. Mastic may be diluted with all the ordinary solvents, but alcohol in quantity appears to precipitate a portion giving rise to a milky appearance.

With a view of testing the durability of varnishes prepared with essentials oils of the genera Eucalyptus and Melaleuca, many experiments have been undertaken; numerous surfaces coated with them, and with varnishes of established reputation, have been placed in sheltered and exposed situations, and the effects of sun and moisture, and of shade, compared and noted from time to time; but the results obtained are as yet too imperfect to admit of their embodiment in the present report, investigations of this kind requiring much time for their satisfactory completion.

B.

Essential Oils from Indigenous Victorian Plants adapted for use in Medicine, Perfumery, Etc.

Under this heading all the oils obtained from the genera Eucalyptus and Melaleuca, which have just been treated of under

Class A, might be again enumerated, inasmuch as they are all possessed of medical properties. In this respect it is probable that they differ from each other only in degree, and that essentially they will all be found to act as diffusible stimulants, anti-spasmodics, and sudorifics, greatly resembling the oil of cajuput to which they are so closely related botanically, and which they approach so nearly in their physical and chemical properties.

Atherosperma moschatum (*Native Sassafras*).—This beautiful tree requires a humid soil and climate, and is met with in the Fern Tree gullies of Victoria, and Tasmania, sometimes in considerable abundance; it attains in such localities the dimensions of a middle sized tree. The bark of the A. moschatum, which formed one of the contributions to the Exhibition, is now recognized in this Colony as a useful addition to the Materia Medica, and is rising in the estimation of medical men. It contains an essential oil obtainable by distillation, which acts with great energy upon the vital functions; the manufacture of which in quantities is now regularly prosecuted. It is sold for about 15s. per ounce.

This oil has a thin unctuous consistence, and a pale yellow color when first distilled, deepening to a yellowish brown by age. Its smell is oppressive and disagreeable, resembling that of the sassafras oil of commerce—whence the popular name of the Victorian tree—with an admixture of oil of carraways. Its taste is aromatic, and rather agreeably bitter, producing a local prickling sensation upon the tongue, which lasts for some time, but does not extend to the fauces. This oil is heavier than water, its specific gravity being 1·04, and its boiling point is very high, namely, 446° F., the mercury continuing to rise until it reaches 473°. It burns under all circumstances with a very smoky flame.

The physiological effects of this oil, in small doses, are described as diaphoretic, diuretic, and sedative, and it appears to exert a specific lowering influence upon the heart's action. As a medicine, it has been introduced into the hospitals, and employed in cases of heart disease; the dose being one drop administered at intervals of six or eight hours. In large quantities it must be regarded as a dangerous poison. Rubbed externally upon the skin, it does not, like the myrtaceous oils, act as a rubefacient or irritant.

In the preparation of this liquid the bark is reduced—if possible while it is yet green—to small shavings or chips; 100 lbs. of these when dry yield 18 ounces 6 drachms.

The leaves of the Victorian Sassafras also yield an essential oil, of which as yet no examination has been made.

Although partaking of the nature of a digression, it has been thought advisable to attach to the description of the oil of the Victorian Native Sassafras, the following remarks, bearing upon some of the other proximate constituents of this interesting bark.

For some years past it has been known that a decoction of the bark of the Atherosperma moschatum was possessed of valuable therapeutic properties, as a diuretic, and diaphoretic, some of the first physicians in Victoria having employed it also in bronchial affections with beneficial results. The decoction of this drug is a dark colored fluid, of a peculiar bitter flavor, from which by far the greater part, if not the whole of the volatile oil is expelled by boiling. To the latter substance therefore its physiological effects cannot be ascribed, and require to be sought for in some other active agent. Judging from these facts Dr. Mueller acquired the conviction that the bark contained an alkaloid, or other equally important substance, the investigation of which would lead to valuable practical results; and he accordingly forwarded a quantity of the new drug to Professor Dr. Wittstein, of Munich, who entrusted its analysis to M. N. J. Zeyer, and the result has proved that Dr. Mueller's anticipations were well founded.

M. Zeyer has published a detailed and very interesting account of the results arrived at, and the methods he employed to obtain them. He found the bark to contain in addition to woody fibre, an essential oil, a fat oil, coloring matter, wax, albumen, gum, sugar, an alkaloid, starch, resin, tannic acid, butyric acid, and oxalic acid, together with inorganic substances consisting chiefly of lime, silica, and the alkalies, and amounting in weight to 4·05 per cent. of the bark, dried at 212° F.

Of the above substances, the alkaloid is undoubtedly the most important; its existence has not hitherto been known, and to it the name of Atherospermine has been given. The properties of this substance are peculiar, and without entering too much into detail, the more important of them may be summed up in a few words.

Atherospermine presents the appearance of a greyish white powder, exceedingly light, and electric; its particles shewing a great tendency to adhere together in little masses. It has no smell, and tastes persistently bitter. Under the microscope it gives

indications of a commuted crystaline character. Heated carefully per. se., it melts, and emits the odor of putrifying meat, which is followed by empyreumatic vapors. It melts at 262·4° F. In water it is but little soluble, 1 part requiring 600 parts to dissolve it; but even this quantity imparts a bitter taste to the water. Ether and boiling alcohol both take it up; the solution in the latter giving an alkaline reaction. It is very soluble in chloroform, sulphide of carbon, and oil of turpentine, also in dilute, and concentrated acids. M. Zeyer has obtained for this substance the formula $C_{30}\ H_{20}\ NO_5$.

Its physiological effects have not as yet been subjected to investigation.

The extract prepared from the decoction of this bark produced while operating upon it in the still, forms one of the exhibits submitted to the Jurors. It contains, judging from M. Zeyer's analysis, the new alkaloid and tannic acid, or rather a peculiar variety of that acid, together with most of the other organic substances enumerated above, with the exception of the resin, which boiling water alone is not capable of separating from the woody portion of the bark left in the still.

In concluding this account of the Atherosperma moschatum, it is of interest to draw attention to the fact, that this tree belongs to the Monimiaceæ, a family of plants largely represented in South America, and also found in Asia, and Australia; but from which, until the present time, no drug has been procured.

Prostanthera lasianthos.—This species of Prostanthera is widely distributed, and is one of the most common of the smaller trees met with in the forest valleys of Victoria, and Tasmania, as also in a portion of New South Wales. The oil is procured from the leaves, which, should its medical properties bring it into request, could without difficulty be obtained in large quantities for distillation. The oil is a limpid, greenish-yellow fluid, of a mint-like odor, and rather mild mint-like taste; the after-taste is not disagreeable. The specific gravity of this fluid is 0·912, and the yield from 100 lbs. of fresh leaves is 2 ounces 4½ drachms. It is worthy of remark, that this plant is one of the few species of the comprehensive order of *Labiatæ*, which attains to large arborescent growth.

Prostanthera rotundifolia.—This plant is of a shrubby character, and is not so common as that which has just been noticed.

It yields an oil which resembles that from the P. lasianthos, both in smell and taste. In color it is darker, and its specific gravity is also considerably higher, being 0·941. The yield from 100 lbs. is 12 ounces.

Mentha Australis.—This plant and the two following are true mints; they do not exceed the size of herbs, or half shrubs. They are all available in very considerable quantity in Victoria, and are also found in New South Wales, South Australia, and Tasmania. Of the Mentha Australis three samples of oil have been forwarded to the Exhibition. It is procured by the distillation of the herb; and as the leaves do not constitute more than one-fourth by weight of the whole, its productiveness must be regarded as tolerably considerable. The yield is variously stated, as will be found recorded in the table concluding this class of oils. Owing to the smallness of the quantities produced, the specific gravity of this oil could not be determined.

In taste and smell this oil hardly differs from ordinary oil of peppermint, but it may be described as somewhat coarser than the best samples of that substance.

This oil would undoubtedly be a saleable commodity in this country, for the use of the druggist and confectioner, in place of the imported peppermints, some of which suffer adulteration to a large extent.

Mentha grandiflora.—This mint has a fiery, bitter, and very unpleasant nauseous taste, together with the characteristic after-taste; it could not be used as a substitute for common peppermint, except for medical purposes. Its specific gravity is 0·924, and its yield 5 ounces from 100 lbs. of the fresh herb.

Mentha gravilis.—The herb from which this oil is produced contains a portion of its volatile oil in the stems; the total yield from 100 lbs. of the green plant being 3 ounces. In its properties this oil resembles the M. Australis more closely than the M. grandiflora. Its smell is like oil of peppermint, with a slight admixture of pennyroyal. Its taste is very diffusible, but less pungent than the officinal oil.

There can be no question that for medical purposes the three oils of the genus Mentha, which have been described, would prove to be carminative stimulants like the European species.

Zieria lanceolata.—This shrub or small sized tree is an inhabitant of moist valleys and river banks, in Victoria, New South Wales,

and Tasmania. Its botanical classification requires it to be placed with the plants of the Rue tribe, and in the same category with the next following genus.

It is thought that both these plants might be used medicinally as substitutes for the South African bucco.

The supply of oil from the leaves of the Zieria lanceolata is tolerably copious, 100 lbs. of the fresh green shrub inclusive of branchlets furnishing 6½ ounces of a pale yellow limpid oil, the odor of which is hardly distinguishable from that of the oil of rue, though perhaps a little less intense and penetrating. Its taste is very disagreeable and acrid, strongly resembling that of rue.

The medicinal action of this oil is that of a diuretic and diaphoretic.

Eriostemon squameus.—The oil from this shrub resembles that of the preceding, but is less disagreeable, and more aromatic both in taste and smell, and is in these respects also preferable to oil of rue. 100 lbs of the freshly gathered leaves and branchlets yield 4 ounces of a pale yellow oil.

Pittosporum undulatum.—The essential oil from the blossoms of this plant is a limpid colorless fluid, lighter than water, of an exceedingly agreeable odor, resembling the perfume of jasmin flowers. Its fragrance is best developed by solution of a small quantity of the oil in dilute alcohol, in which it is but sparingly soluble.

In taste this substance is disagreeably hot and bitter, with a slight trace of the flavor of the oils of turpentine and rue. Iodine when brought in contact with it gives rise to an explosion.

Irrespective of the odor which the blossoms of this plant exhale, it is a highly ornamental bush, which would flourish well in the South of France, and the distillers of essences and perfumes in that country might cultivate it with great advantage, as it is easily raised from seed, and blooms with great profusion, and would afford a new and agreeable perfume.

Its habitat in Victoria is Gipps Land; it is also found in New South Wales. The seed vessels contain an essential and a fat oil.

This species of Pittosporum is the first likely to be of practical importance; its leaves yield a very bitter extractive principle, as in a still higher degree do also those of the Pittosporum phillyroides.

TABLE SHOWING THE YIELD, SPECIFIC GRAVITY, AND OTHER PARTICULARS OF CERTAIN OF THE VICTORIAN ESSENTIAL OILS SUITABLE FOR MEDICINE, PERFUMERY, ETC.

NAME OF ESSENTIAL OIL.	Month in which the leaves were gathered.	Locality whence obtained.	Yield from 100 lbs.	Specific gravity at 60° F.	By whom distilled.	Remarks.
			ounces.			
Atherosperma moschatum (Native Sassafras)	October ...	Dandenong ...	18·75	1·040	Bosisto...	Distilled from the dried bark.
Prostanthera lasianthos ...	November	Dandenong ...	2·60	0·912	Bosisto...	From fresh leaves only.
Prostanthera rotundifolia...	January ...	Gipps Land ...	12·0	0·941	Bosisto...	Distilled from the fresh herb.
Mentha Australis ...	October ...	Yarra Yarra ...	3·0	...	Bosisto...	From the fresh herb, yield only approximate, bnt not too great.
Mentha Australis ...	October ...	Yarra Yarra ...	1·1	...	Johnson	From the fresh herb.
Mentha Australis ...	October ...	Yarra Yarra ...	1·4	...	Johnson	From the fresh herb.
Mentha grandiflora ...	November	Mount Macedon	5·0	0·924	Bosisto...	From the fresh herb.
Mentha gracilis	November	Port Fairy ...	3·0	0·914	Bosisto...	From the fresh herb.
Zieria lanceolata... ...	December	Dandenong ...	6·5	0·950	Bosisto...	From freshly gathered leaves and branchlets.
Eriostemon squameus ...	December	... ...	4·0	...	Bosisto...	From freshly gathered leaves and branchlets.
Pittosporum undulatum ...	September	Melbourne, Botanical Gardens	2·1	...	Bosisto...	From freshly gathered blossoms only.

RESINS, GUMS, AND GUM-RESINS.

Of the resins proper two representatives only, the products of indigenous trees, are at present known to exist in Victoria, namely, that from the Callitris verrucosa and cupressiformis, and from the Xanthorrhœa Australis. The first mentioned resin from the two trees commonly known as the Desert and Mountain Cypress Pine, may be collected in the northern and north-western parts of the Colony in considerable abundance. It exudes naturally from the bark in tears, or small pendulous masses, and also flows from incisions made to encourage exudation. This substance may be described as a resin of excellent quality, almost identical with the best samples of Sandarac from the Callitris quadrivalvis of the Mediterranean, so largely used in the manufacture of varnishes. It is a transparent, colorless, or pale yellow body, fragrant and friable, fusing at a moderate heat, and burning with a large smoky flame, very soluble in alcohol, and the essential oils, and almost totally so in ether; turpentine at ordinary temperatures does not act upon it, nor do the drying oils, but it may be made to combine with those solvents by previous fusion.

The balsamic resin from the Xanthorrhœa Australis is a substance of much interest. It is found in masses of irregular globular shape, within the body of the tree, and exuding in large tears and drops near its roots. It is a dark red friable substance, the purer homogenous specimens exhibiting a most brilliant ruby color when crushed into fragments; it fuses readily with the same deep color, and exhales the characteristic odor of gum benzoin and dragons blood under such circumstances. In many respects it resembles the last named substance, but its solutions are less intensely red, inclining to yellow, while as a varnish it has much more body and gloss. When grass-tree gum is ignited it burns with considerable energy, and its destructive distillation gives rise to liquid as well as solid products, which have not as yet been investigated. It is very soluble in alcohol, and in the essential oils from the Eucalypti, that from the Dandenong Peppermint proving an exception as already mentioned. Ether takes up a portion only, leaving behind a resinous substance colored more intensely red than that which it dissolves; turpentine exercises no solvent action upon it, and the drying oils but very little. According to Mr. John Kruse, of Melbourne, who examined this substance, and published the

results he obtained in the Journal of the Pharmaceutical Society of Victoria, July, 1858, grass-tree gum contains cinnamic in addition to benzoic acid; and he also mentions the interesting fact, that the action of nitric acid upon it gives rise to picric acid, which he states to be of practical use for dying yellows upon silk or wool.

The Xanthorrhœa Australis is very common in many parts of Victoria, in some heathy localities, as in Gipps Land, covering tracts of many square miles in extent; and the resin, were its uses properly investigated and determined and thereby drawn into technical use, might be collected in very large quantities.

A very interesting discovery of fossil resin has been made by Mr. Richard Daintree, of the Victorian Geological Survey, in the tertiary lignites of the Bass River, in the Western Port district. This remarkable substance was obtained at a depth of about 50 feet below the surface; the formation in which it occurs is of great extent, but not sufficiently explored at present to enable an estimate to be made of the probable quantity of resin available. Like many fossil substances of this class the resin from the Bass River is not easily dissolved in the ordinary menstrua, alcohol and ether take up a portion of it, the former giving rise to a brown colored solution, leaving the insoluble remainder in a swelled and bleached state; the latter forms a clear colorless solution, which by evaporation leaves a pure white residual resin. Turpentine does not exert any solvent power, while the essential oils from Victorian Myrtaceous trees appear to be its best solvents, as only a small insoluble portion remains after their action, consisting to a great extent of mineral impurities. This resinous body appears in small rounded masses, somewhat translucent internally, but possessed of a rough opaque covering; its color is a pale brownish-grey, with a glassy fracture, it is very friable, and inflammable. On being heated it fuses with the disengagement of much volatile matter, causing a frothiness that does not subside for some time. It is less fragrant under these circumstances than the fossil resin of New Zealand, the odor resembling that of Sandarac, a circumstance leading to the opinion that this substance was originally the produce of a tree allied to the genus Callitris. It burns readily, leaving unconsumed a quantity of bright and bulky charcoal.

The genus Acacia furnishes several true gums, of which those from the species A. mollissima, A. dealbata, A. pycnantha, and

A. homalophylla are the most important. These substances exude from the trees, as do the Acacia-gums of commerce, and occur in rounded or irregularly-formed masses, at times almost colorless or pale yellow, but not unfrequently tinged with red or brown. Some samples are occasionally so intersected with an infinite number of cracks as to present an amorphous white appearance. Generally speaking, the Victorian Acacia-gums are somewhat less soluble than the gum arabic of commerce; but, on the other hand, they appear to yield a more adhesive mucilage, which is less liable to splinter and crack when dry. Most of these bodies possess a slight amount of astringency, which varies in one and the same sample from a single tree; and it would seem that while this peculiarity is absent, or but very faintly perceptible, in the pale-colored pieces, it increases in proportion as the color of the gum deepens—a circumstance which would much facilitate their classification.

Under the term Gum-Resins, a numerous series of indigenous vegetable productions may be classed which could be procured in great abundance in Victoria, but which have not hitherto received the attention they deserve. They are produced in greater or lesser quantities by all the species of the genus Eucalyptus, and might be largely accumulated with little trouble by wood-splitters and sawyers throughout the forests of the country.

These substances occur within the trunks of trees of all sizes, in flattened cavities in the otherwise solid wood, which often lie parallel to the rings of growth. In such places the deposition of gum, which is at first a viscid liquid, becomes gradually inspissated, and subsequently hard and brittle. The liquid gum may also be obtained by suitable incisions in the stems of growing trees; but whether such a method affords greater facilities for its collection, than those naturally offered, appears to be still an undecided question.

In their general characteristics the gum-resins from the Eucalypti resemble each other very closely. When in the solid form they present the appearance of small angular masses, intermixed with occasional striated pieces and particles of wood. The prevailing color is dark red-brown, in some cases dull with olive and yellowish tints, in others bright ruby colored and transparent; black and opaque pieces are also very commonly found interspersed through each of the several descriptions of gum-resin.

The fracture, when these substances are thoroughly dried in the

water-bath, is vitreous, and they are moreover then exceedingly friable, and easily pulverized. Desiccation in this way causes them to lose from 15 to 20 per cent. of their weight.

In the mouth they are tough and adhere to the teeth coloring the saliva red; their taste is intensely astringent, without much bitterness; although it should be remarked that in this particular they are not all equally potent.

The liquid gum-resins are very viscid treacle-like fluids, which do not differ in chemical constitution from those which have undergone induration, save that they contain about 65 per cent. of water, capable of being expelled by the temperature of a water-bath.

The solvent action of water on these bodies is not the same in the case of gums from different species of trees. If for instance cold water be poured on the produce of the E. corymbosa, whether it be in the solid or liquid state, a portion only is taken up, while the gum from the stringybark is completely dissolved. When as in the case just cited a flocculent residue remains after the action of water a few drops of ammonia render the solution perfect.

The aqueous solutions of the eucalyptine gum-resins all give an acid reaction with test-paper; but the differences in the behaviour of each, when dissolved by water, subjected to the several re-agents, become very manifest. The precipitate caused by a solution of gelatine—indicative of tannic acid—does not appear in any case to correspond in quantity with their intense astringent taste; and occasionally the addition of that substance causes no precipitate at all. This fact has an important bearing upon the value of this whole class of bodies under consideration for tanning purposes, and as substitutes for catechu and similar bodies.

With acetate of lead these astringent bodies give copious gelatinous precipitates; and with the salts of iron various shades of green and black. The mineral acids also determine in them bulky flocculent deposits.

One or more of the substances which have been made the subject of the foregoing very imperfect sketch appear to have been forwarded from these colonies from time to time, in small quantities, to Great Britain, and to bear there the name of Botany Bay kino; but little seems to be known respecting their properties or uses, the general belief being that Australian kino is only furnished by the Ironbark tree (E. resinifera). It becomes, therefore,

the more necessary to follow up this subject to a conclusive termination, to establish by a searching chemical investigation the proper uses of substances so abundantly available, and thereby increase the industry and prosperity of the land.

In submitting the results of their labors to the judgment of the public, no one can feel more sensible than the Jurors themselves of the imperfections and deficiencies of their Report. But while they neither invite nor deprecate the criticism which it may receive, they are conscious of having brought whatever abilities they possessed to the best execution of their work. It has been undertaken and prosecuted under the disadvantages arising from the limited period assigned to its preparation, and the constant interference of other duties and occupations; so that various subjects, on which more extended observations are desirable, have necessarily been left to future opportunities and further research. And if, in what they have done, they may succeed in awakening an increased attention to Colonial products and resources, and in directing the practical tendencies of the age in which they live to new employments of industry, and skill in their development, the Jurors will enjoy the pleasing satisfaction of having labored, not altogether in vain, for the progress and welfare of their adopted country.

To many artisans and exhibitors they desire to express their thanks for much valuable information which has been incorporated into these pages; and especially to Dr. Mueller, the learned Government Botanist of Victoria, for his unvarying kindness and readiness to assist them on every occasion they have wished to consult him, the Jurors must ever remain indebted beyond their ability to acknowledge.

By Authority: John Ferres, Government Printer, Melbourne.